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ABSTRACT

This guide provides operators of driving schools with a body of information and procedures that will enable them to develop programs capable of meeting the particular needs of their students, and capable of being administered within the resources available to them. The guide does not attempt to prescribe one specific instructional program but instead offers flexibility, together with details and resources to be used or supplemented. Part 1 discusses the characteristics of the highway transportation system, its relationship to accident causation, and the programs that exist to improve the effectiveness of the system. Part 2 deals with the components of the instructional system: (1) the system itself and its objectives; (2) the professional driving instructor; (3) curriculum development; and (4) curriculum administration. Part 3 offers a guide for 60 driving tasks in four general areas: basic controls, driving procedures, emergency procedures, and system maintenance. For each task suggested procedures and skills to be acquired, learning problems to be anticipated, hazards and laws involved, and suggested instructional aids and resource materials are included. The two appendixes consist of lists of addresses of suppliers of instructional aids and resource materials. (Author/BP)

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Guide for Teacher Preparation in Driver Education

Driving School Edition

Prepared for

U.S. Department of Transportation
National Highway Traffic
Safety Administration
Washington, D.C. 20590
Contract FH 11-7602

June, 1975

U S DEPARTMENT OF HEALTH,
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Preface

This Guide was prepared by the Human Resources Research Organization (HumRRO) of Alexandria, Virginia, under contract to the National Highway Traffic Safety Administration (Contract No. FH 11-7602). It is intended for use by the driving school industry in its efforts to upgrade the quality of professional driving instruction. A companion report entitled "Guide for Teacher Preparation in Driver Education: Secondary School Edition" has been developed for institutions engaged in preparing those who will teach driver education within the secondary school system.

This document was prepared by the staff of the Safety Research Program of HumRRO's System Operations Division, Dr. J. Daniel Lyons, Director. The Principal Investigator for the contract was Dr. A. James McKnight, while Dr. Alan G. Hundt served as Project Director. The remainder of the staff included Ms. June Cunningham, Mr. Jerome Corbino, Ms. Jane V. Lee, and Ms. Lola M. Craw.

The HumRRO staff was assisted by an advisory panel consisting of Mr. Paul Halula, Mr. Richard R. Redinger, and Mr. Warren Rumsfield.

The information from which this Guide was prepared came from a variety of sources. However, particularly extensive use was made from information contained in the following publications:

> Aaron, James E. and Strasser, Marland K. ***Driver and Traffic Safety Education: Content, Methods, and Organization,*** The MacMillan Company, New York, 1969.
>
> Anderson, William G. ***In-Car Instruction: Methods and Content—A Manual for Teachers of Driver and Traffic Safety Education,*** Addison-Wesley Publishing Company, Reading, Massachusetts, 1968.
>
> Anderson, William G. ***Learning to Drive: Skills, Concepts, and Strategies,*** Addison-Wesley Publishing Company, Reading, Massachusetts, 1971 (including Laboratory Manual and Teachers Manual for the same publication).

Sincere appreciation is extended to Drs. Aaron, Strasser, and Anderson for the major contribution they have made to this Guide.

Appreciation is also expressed for the assistance provided by Dr. Earl D. Heath, NHTSA Contract Technical Manager at the time the work began, and to Dr. William E. Tarrants, Director of the Manpower Development Division, NHTSA, who later assumed technical management of the contract. Other representatives of NHTSA who made valuable contributions include Dr. Leroy Dunn and Dr. Nevelle Moore.

Purpose

As a step toward improvement in driving instruction, HumRRO, under National Highway Traffic Safety Administration Contract No. FH 11-7602, has developed this Guide for Teacher Preparation in Driver Education, which provides operators of driving schools with a body of information and procedures that will enable them to develop programs capable of meeting the particular needs of their students, and capable of being administered within the resources available to them.

This Guide does not attempt to prescribe one specific instructional program. A single program would not provide the flexibility required to cope with varying situations; nor could a single program accommodate the changes in needs and resources that are constantly occurring in the worlds of transportation and education.

Part I discusses the characteristics of the highway transportation system, their relationship to accident causation, and the programs that exist to improve the effectiveness of the system.

Part II deals with the components of the instructional system: (1) the system itself and its objectives; (2) the professional driving instructor; (3) curriculum development; and (4) curriculum administration.

Part III offers a guide for instruction in some 60 driving tasks, suggesting procedures and skills to be acquired for each task, learning problems to be anticipated, and hazards and laws involved. Suggested instructional aids and resource materials are also included.

Contents

Part .... Page

I Highway Transportation System I-1
  Introduction I-3
  Components of the Highway Transportation System I-3
  Highway Safety Problem I-4
  Highway Safety Programs I-4
  Management of Highway Safety Programs I-5
  Driver Licensing I-6
  Police Traffic Services I-7
  Traffic Courts I-8
  Vehicle Registration and Inspection I-9
  Vehicle Safety Engineering I-10
  Highway and Traffic Engineering I-11

II Functions of Driving School Instruction II-1
  A. Objectives of Driving Instruction II-3
    Effective Driving II-3
    State and Federal Requirements II-3
  B. The Driving Instructor II-5
    Recommended Standards for Driving Instructors II-5
    Driving School Instructor Functions II-5
    Instructor Qualifications II-7
    Methods of Maintaining Professional Competence II-8
  C. Curriculum Development II-29
    Objectives of Driver Instruction II-29
    Selection and Organization of Instructional Content II-33
      Organizing Content II-35
    Selection of Instructional Methods and Media II-37
      Classroom Instruction II-37
      Simulator Instruction II-48
      Driving Range Instruction II-55
      On-Street Instruction II-59
    Lesson Plan Development II-65
      Sample Lesson Plan Outline II-67
    Proficiency Evaluation II-75
  D. Curriculum Administration II-81
    Planning and Procurement II-81
      Determination of Instructor Requirements II-81
      Selection of Training Devices II-83

Part — Page

II (Cont.)
Planning and Designing a Driving Range Facility II-86
Planning a Simulator Facility II-90
Instruction II-92
Use of Classroom Aids II-92
Use of the Simulator Laboratory II-93
Use of the Multiple Car Driving Range II-96
Program Administration II-100
Special Programs II-106
Driver Improvement II-106
Instructing Handicapped Students II-108

III Driving Tasks III-1
Introduction III-5
A. Basic Controls III-7
Preoperative Procedures III-9
Starting III-15
Accelerating III-19
Steering III-25
Speed Control III-31
Downshifting III-35
Stopping III-39
Backing III-45
Turnabouts III-51
B. Driving Procedures III-57
1. General Procedures III-59
Surveillance III-61
Urban Driving III-67
Highway Driving III-71
Freeway Driving III-75
2. Normal Driving Situations III-71
Following III-83
Passing III-87
Leaving Traffic III-95
Entering Traffic III-99
Lane Changing III-105
Parking III-109
Emergency Areas III-117
Parked/Parking Vehicles III-119
Overtaking III-123
Special Vehicles III-127
Negotiating Intersections III-131
Traffic Circles III-141
On-Ramps III-145
Off-Ramps III-151

Part
III
(Cont.)

Page

Hills III-155
Curves III-159
Lane Usage III-163
Off-Street Areas III-167
Railroad Crossings III-171
Bridges, Tunnels III-175
Toll Plazas III-179
3. Adverse Driving Conditions III-181
Road Surfaces III-183
Wet Surfaces III-187
Sand-Covered Roadways III-193
Road Shoulders III-195
Obstructions and Barricades III-199
Snow and Ice III-201
Weather Conditions and Limited Visibility III-209
4. Night Driving III-215
5. Special Conditions III-223
Towing a Trailer III-225
Hauling Loads III-229
On-Road Malfunctions and Breakdowns III-231
Pushing/Towing III-235
C. Emergency Procedures III-239
Skid Control III-241
Anticipating Traffic Emergencies III-245
Reacting to Traffic Emergencies III-251
Car Emergencies III-257
Post-Accident Responsibilities III-261
D. System Maintenance III-265
1. Driver III-267
Trip Planning III-269
Alcohol and Drugs III-273
Physical/Emotional Conditions III-281
2. Car III-289
Loading the Car III-291
Loading and Attaching Trailers III-293
Symptoms of Car Malfunctions III-295
Car Maintenance III-299
3. Highway Transportation System III-305
Traffic Laws III-307
Car and Driver Certification III-315
Auto Insurance III-317
E. Appendix III-321
1. Suppliers of Instructional Aids III-323
2. Suppliers of Resource Materials III-325

Part I

HIGHWAY TRANSPORTATION SYSTEM

Introduction

The student should know the characteristics of the highway transportation system, their relationship to accident causation, and the nature of programs that exist to improve the effectiveness of the system.

The culture of America is oriented to the automobile. In seven decades the automobile has become an indispensable part of the economic and social life of the United States. Despite efforts to encourage alternative modes of transportation—particularly mass transit—the number of automobiles increases. At present well over 100 million licensed drivers operate a like number of registered vehicles. Three quarters of the families in America own at least one car.

The availability of the automobile has given Americans new freedom in their choice of business, social, and cultural activities. Among its effects upon our society are the following:

- The creation of a new industry, the auto industry, and many others that could not have existed without the auto.
- The organization of the country's public school system.
- A rural-urban character of the nation.
- A general decentralization of merchandising.
- The location, design and construction of housing.

Components of the Highway Transportation System

The student should know the specific components of the highway transportation system.

The automobile and the person who drives it are part of a large, complex highway transportation system. This transportation system includes, in addition to the driver and his vehicle, the roadway over which the vehicle is driven and the traffic the driver encounters, and the natural environment in which the driver operates the vehicle. How well these components interact with one another will determine how effective the highway transportation system is in achieving its goal—the safe, rapid, and comfortable movement of people and goods from one place to another.

The Driver. Since it is the driver who sets the highway transportation system in motion, it is the driver's performance that, more than anything else, determines how effectively the system will operate. The driver's performance is, in turn, greatly influenced by the early instruction he receives. This instruction not only helps to establish the knowledges and skills that determine how well he can perform, but it also can exert a strong influence over the attitudes and habits that determine how well he will perform.

The Vehicle. While improvements must be sought, today's automobile is still, on the whole, a potentially safe and dependable piece of equipment. However, whether this potentiality is realized depends largely on its human operator. He must be prepared to drive it effectively and keep it in safe operating condition through routine maintenance and repair.

Roadway. Today's roadway system measures more than 3½ million miles. It would take a driver, covering 300 miles a day, more than 33 years to drive the entire system. In order to utilize this roadway system effectively, the driver must be able to cope with its characteristics—its hills, curves, intersections, on-ramps and off-ramps. He must also react properly to the signs, control signals, and lane markings that have been provided to regulate the flow and enhance the safety of highway travel.

Traffic. The presence on the roadway of other roadway users, including automobiles, trucks, buses, and pedestrians, constitutes a potential obstacle to the driver's progress and a hazard to his safety. Since traffic is composed largely of vehicles and drivers, it does not constitute a separate component of the highway transportation system in any objective sense. However, from the viewpoint of the individual driver—who, after all, represents the focal point of this Guide—traffic represents an important and formidable component of the system. The demands it places upon him are heightened by the fact that other road users are not static, but move in a complex and often unpredictable pattern.

The Environment. The natural environment in which the highway transportation system operates, because it interacts with other components in determining the effectiveness of the system, may be conveniently viewed as an inherent part of the system itself. Changes in illumination, weather, and temperature, ranging from normal to extreme, create a condition to which the driver must adapt.

Highway Safety Problem

The student should know the relationship of highway transportation system to the cause and prevention of highway accidents.

To provide safe and rapid transportation, the various components of the highway transportation system must interact in an effective manner. When the interaction breaks down, the result is an accident or traffic congestion. It is the accident problem that represents the primary concern of this Guide. Enhancement of traffic flow, while important, is a lesser consideration. In actuality, the distinction between the two is more logical than real. On the whole, that which enhances safety expedites traffic, that which enhances traffic flow reduces the chances of an accident. In short, an effective interaction between highway system components is largely the same whether effectiveness is measured in terms of safety or traffic flow.

The concept of an accident as resulting from an ineffective interaction among system components is important because it focuses attention on the way in which system components work together rather than on individual factors. When an accident occurs, there is rarely a single "cause." A driver who has an accident on a rain-slick curve is not solely responsible for it. True, had he been driving more slowly, the accident might not have occurred. However, had the curve been better marked or banked, or had the pavement been dry, the accident might have been prevented. Studies of accidents, therefore, must focus on the interaction of factors producing the accident. Similarly, efforts to prevent accidents must focus on improving the nature of this interaction.

Highway Safety Programs

The student should know the elements of existing highway safety programs and their relation to driver education.

A multifaceted highway safety problem demands a multifaceted program of accident prevention. To a certain extent, such a program does now exist. Some elements of this program, like driver education, are focused upon the driver. They attempt to enhance highway safety through improving the driver's performance. These include such activities as driver licensing, police traffic services, and traffic courts. Another set of elements is concerned with the attempt to improve vehicle performance. These include vehicle registration and inspection and vehicle safety engineering. A final group of elements focuses upon the inherent safety of the highway. These include highway engineering, which is concerned with the design and construction of roadways, and traffic engineering, which is concerned with control systems to regulate flow of traffic over the highway.

The various elements of the highway safety program, to the extent that they interrelate with one another, form what might be called a "highway safety system." If the driving instructor is to function as part of such a system, he must be familiar with other components of the system, particularly those with which he most frequently interacts. He should certainly be familiar with driver licensing requirements, traffic laws and ordinances, and vehicle registration requirements. While his relationship purely with the vehicle and highway components of the system is somewhat more remote, he should still have some familiarity with them.

At present, it seems fair to say that only a minority of driving instructors view themselves as being a part of a highway safety program, or as having much in common with those who play an acknowledged role in highway safety. Indeed, it is probably true that the relation of many driving instructors to highway safety is a lot more tenuous than their own students believe it to be. This state of affairs becomes embarrassingly evident in an instructor's inability to answer such questions as: "Why do I have to come to a full stop at a stop sign?"; "What can they do to me if I refuse to take a breath test?"; or "Why didn't they build a cloverleaf at such-and-such interchange?". However, the industry at large is striving to increase the level of professionalism among its constituents and an increasing awareness may be expected among the nation's driving instructors of the range of organizations and people sharing their concern for safe driving.

Management of Highway Safety Programs

The student should know the assignment of responsibilities for management of federal and state highway safety programs.

Efforts to unite various activities concerned with highway safety into an integrated program began in the early 1930's with the first real public awareness and concern over the highway injury and death rate. Various federal, state, and local agencies and committees were established to undertake the planning needed to see that funds were obtained and applied in a way that would have the most beneficial effect upon highway safety.

A significant event in the effort to develop integrated programs was the passage of the Highway Safety Act of 1966. This Act authorized grants-in-aid on a matching basis to assist states and their local subdivisions to develop, expand, and improve their safety programs. However, to qualify for funds, states were required to have a highway safety program approved by the Secretary of Transportation. Requirements for programs were established under the following 16 Highway Safety Program Standards:

Periodic motor vehicle inspection
Motor vehicle registration
Motorcycle safety
Driver licensing
Driver education
Codes and laws
Traffic courts
Alcohol in relation to highway safety
Identification and surveillance of accident locations
Traffic records
Emergency medical services
Highway design, construction, and maintenance
Traffic control devices
Pedestrian safety
Police traffic services
Debris hazard control and clean-up

Proposed activities and funding requirements for each state are set forth in its annual Highway Safety Work Program. Preparation of this program is coordinated by the Governor's Highway Safety Representative. Many of the materials and facilities currently used to support instructional programs in various communities were obtained through funds obtained under the state highway safety program. These funds are frequently called "402 funds," after the section of the Highway Safety Act that authorized them.

At the federal level, the program is administered by the National Highway Traffic Safety Administration (NHTSA). In addition to its review and approval of state programs, NHTSA provides, under Section 403 of the Highway Safety Act, complete support of research and development projects designed to furnish information and projects in furtherance of state programs. These "403 funds" were used to support development of this Guide.

Driver Licensing

The student should know the objective and nature of driver licensing functions and their relation to driver education.

The objective of the driver licensing function is to assure that the opportunity to drive is extended only to those who are qualified to operate a vehicle safely.

All states require drivers to obtain licenses before they may operate a motor vehicle. The licensing procedure involves the following components:

- Evaluation of credentials
  - Birth certificate
  - Driver education certificate
- Examination
  - Physical screening
    - Physical handicaps or deformities
    - Hearing
    - Shakiness, unsteadiness
    - Obvious symptoms of disease
  - Visual screening
    - Acuity
    - Color
    - Field of vision
    - Glare recovery
  - Knowledge test
    - Road signs
    - Rules of the road
  - Performance test
    - Starting
    - Stopping
    - Shifting
    - Turning
    - Backing
    - Parking
- Administrative functions
  - Photograph
  - Fee collection
  - Processing of license documents

Basic types of operator's licenses include the following:

Learner's permit—A certificate that allows an individual of specified age to operate a vehicle for learning purposes under the supervision of a licensed driver.

Operator's license—A certificate that allows an individual to operate a motor vehicle for his own purposes, whether business or pleasure.

Chauffeur's license—A certificate that allows an individual to operate a vehicle in the employ of another individual or an agency, including operation of trucks, buses, school buses, and taxis.

Restricted license—Any of the above licenses in which specified restrictions are imposed upon particular operators; such restrictions may relate to the need for special aids (e.g., glasses), hours of the day in which the vehicle may be operated, type and construction of the vehicle, or range of travel.

In addition to issuing operators' licenses, the licensing activity also maintains records of traffic offenses of which drivers are convicted and records suspensions or revocations of licenses. The records are generally maintained within the state motor vehicle department, which administers the licensing function. Records may also be kept at other locations such as police departments, traffic courts, and research agencies. The primary objectives in maintaining accident records are the following:

- To allow police to determine whether an individual driver's license has been suspended or revoked.
- To allow courts to consider previous offenses when sentencing convicted driver (not to determine guilt or innocence).
- To operate a "point" system. Under such a system, drivers receive points for traffic offenses, according to an established weighting system. Specified numbers of accumulative points result in issuance of warnings, and suspension of licenses.
- To allow other states to consider an applicant's driving record for granting a license.

Because of the mobility of today's driving population, states readily exchange information with one another. To help foster interstate cooperation, the U.S. Department of Transportation maintains a National Driver Register. At the request of the state licensing agency, the name of the new applicant will be checked against the Register's files to determine whether that applicant's license is reported as having been revoked or suspended in another state.

Of all elements of a highway safety program, driver licensing has the closest relationship to driver instruction. Both have as a common concern the driver's ability to operate a vehicle safely. Driver instruction is concerned with the development of that ability, driver licensing is concerned with assessing its attainment. In the eyes of many students, driver instruction is merely a means by which a student qualifies for a driver's license. This relationship has been reinforced by the requirements imposed by many states, that persons under the age of 18 complete a formal, "approved" course before they apply for a license.

To the extent that instruction and licensing share the same goal—which is, to make sure that prospective drivers are able to operate a vehicle safely—it behooves the driving instructor to prepare his students for the license examination. However, the instructor should recognize that the goal of his instructional program is safe driving, not simply preparing the students to pass the examination, and he should attempt to see to it that students accept this goal. No professional driving instructor should ever aid a student in circumventing the objectives of the examination; nor should he encourage an unqualified student even to take an examination. A truly competent instructor will generally gain a better idea of an individual's ability to drive safely in an hour or more of in-car instruction than will the driver licensing examiner in the brief period typically available to him for testing. Unless he applies his information in the interests of highway safety, he does his student, as well as society at large, a great disservice.

Police Traffic Services

The student should know the objectives and functions of the police with respect to traffic services, and the relation of this activity to driver education.

The objective of service performed by police in the highway transportation system is similar to that of the professional driving instructor—to assure safe vehicle operation and effective flow of traffic. This objective is fulfilled by the following:

- Identifying unsafe or otherwise ineffective operators for warning or prosecution.
- Directly supervising traffic flow.
- Assisting the injured and restoring traffic flow following an accident.
- Investigating and reporting accident causes and consequences.
- Providing information to motorists.
- Assisting in license examinations.

The driving instructor can assist the police in improving the safety of the highway transportation system by encouraging his students to (1) observe traffic laws, and (2) support the police in their performance of traffic services. Specific activities that may be performed in this regard include the following:

Emphasizing the "service" function of the police.

> The term "Police Traffic Services" implies a broader range of activities than "law enforcement" and is a truer reflection on the role played by police in the highway transportation system. The police functions identified in the preceding paragraph should be described in terms of their benefit to the prospective driver.

Attempting to overcome misconceptions concerning police operations.

Encouraging students to support legislation that removes police departments from political influence or dependence upon fines for revenues.

Encouraging students to give assistance to police where possible, e.g., care of the injured at an accident site.

Traffic Courts

The student should know the objectives and functions of traffic courts and their relation to driver education.

The objective of the traffic court system is to encourage safe vehicle operation and effective traffic flow—indirectly, by creating strong incentives for observance of traffic laws; directly, by providing for the rehabilitation or removal from the road of traffic offenders.

On the average day over 100,000 motorists are charged with a traffic violation of some nature. While the majority may never actually reach the courtroom, most are—at least in theory—processed by the traffic court. Processing of cases involves the following functions:

Pretrial Procedures
  Verifying complaints and citations.
  Issuing summonses.
  Setting trial dates.
  Granting dismissal or continuances.
  Obtaining relevant records.
Trial Procedures
  Conducting trials.
  Granting warrants or accepting forfeiture of bail for nonappearance.
  Disposing of cases, dismissal, acquittal, conviction.

Posttrial Procedures
  Presentence investigation.
  Sentencing.
  Collecting fines.
Follow-up
  Probation hearings and reports.
  Reports of medical or psychiatric examination.

Most courts do a commendable job of adjudicating traffic cases. Despite the complaints of motorists, very few wrongful convictions or excessive punishments are imposed. There is a more likely occurrence on the side of leniency. However, today's traffic courts are confronted with a number of problems that hamper the administration of justice. The most serious of these problems are the following:

- Traffic courts, like most other courts, labor under excessive case loads. As a consequence, they are unable to give individual cases the attention, in the form of record checks, presentence investigation, hearing of witnesses, that the public and the courts could wish.
- Only a minority of judges are fully prepared to try traffic cases. Many magistrates and small town judges have no legal training. Many of those who do have legal training are unfamiliar with the problems of highway safety. It is primarily in the larger cities, where a separate traffic court may be supported, that judges are fully trained with respect to both the judicial and highway transportation system.
- Many traffic courts, particularly in smaller cities, are dependent upon fines for necessary revenues. While this practice is deplored by judicial and law enforcement groups as well as the public at large, its elimination requires the willingness of legislative groups to provide support through taxes.

In the interests of highway safety, the driving instructor should help to overcome misconceptions and negative attitudes concerning traffic courts by:

Accepting court magistrates as "colleagues" in highway safety.

Becoming familiar with the nature of court operation.

Devoting at least a few moments of class time to a discussion of traffic courts.

Avoiding disparaging remarks concerning traffic courts.

Not reinforcing any negative remarks of his students concerning traffic courts.

Vehicle Registration and Inspection

The student should know the objectives and requirements of vehicle registration and inspection.

The objective of vehicle registration and inspection programs is to establish legal responsibility for a vehicle thus helping to assure that it is operated safely and maintained in a safe condition. A motor vehicle is a potentially dangerous piece of equipment. Public safety demands that someone assume legal responsibility for each vehicle and financial responsibility for the results of its operation. Registration permits the owner of the vehicle to be identified whenever the vehicle is involved in an accident or traffic offense, or is used for an illegal purpose. Vehicle registration also aids in the location and identification of the vehicle itself whenever it has been stolen or used for an illegal activity; or when an emergency requires contact with the vehicle's operator.

To help assure that vehicles are maintained and equipped for safe operation, many states require vehicle inspection. The Federal Motor Vehicle Safety Standards encourages states to inspect vehicles upon initial registration and at least once a year thereafter. While many states meet or exceed this standard, many only require inspection upon registration or sale, random spot inspections, inspection following accidents, or no inspection at all.

The registration and inspection requirements that are imposed upon drivers are dealt with later in this Guide in connection with driving instruction (Part III). However, in addition to meeting requirements, drivers must be encouraged to give support to vehicle safety programs. Many drivers tend to look upon both registration and inspection as an inconvenience created primarily for the purpose of raising revenues. The fees that are collected generally do little more than cover the cost of the program. What is left over is typically applied to services that benefit drivers. Driving instructors should, where possible, emphasize the impact of registration and inspection programs upon the safety and welfare of the individual driver and the public at large.

Vehicle Safety Engineering

The student should know the aspects of vehicle engineering that influence safety of operation.

The automobile, in both design and installed equipment, is becoming safer to operate each year. However, safety must compete with other considerations, including the following:

Style

American consumers are extremely style conscious in their purchase of automobiles. Those safety features that cannot be readily accommodated within a contemporary, attractive design are difficult to sell.

Economy

Safety engineering costs money. Unfortunately, experience has shown that consumers tend to resist paying for design features whose sole function is safety. Such features must generally be made mandatory before they can be widely implemented.

Convenience

Safety features that are inconvenient to use tend not to be accepted, or, if they are accepted, not used. A great deal of the attention that has been devoted to "passive" restraint systems is a result of the inconvenience caused by lap belts and shoulder harnesses.

Automobile engineering characteristics that influence the safety of operation are those that relate to the driver's ability to see, his ability to communicate his presence and intent, his ability to control the vehicle, and his protection from possible injury in the event of an accident. These characteristics include:

Visibility Characteristics

Windshield–area, contours, lack of distortion.
Windshield wipers–blade actuation.
Door pillars–size, location.
Hood, fenders–height, shape.
Mirrors–size, shape, location.
Headlights–intensity, direction, focus.

Communication

Headlights, taillights—intensity, color, standardization.
Brake lights—intensity, location, color.
Turn signals—location, color.

Control

Steering system—ratios, linkage.
Tires—traction, reliability.
Brakes—stopping power, reliability.
Shock absorbers, suspension system.

Protection

Dashboard—design, padding, standardization.
Steering column—design ("break away"), padding.
Restraint systems
    Active—lap belt, shoulder harness.
    Passive—air bag.
Windshield construction.
Door latches—design, method of actuation.
Body construction.
Interior design.

Under the National Traffic and Motor Vehicle Safety Act of 1966, the National Highway Traffic Safety Administration (NHTSA) has responsibility for developing and assuring compliance with the Federal Motor Vehicle Safety Standards covering all aspects of vehicle design and construction. In fulfillment of its responsibilities, NHTSA carries on the following vehicle-related activites:

- Accident investigation by multidisciplinary teams to identify causes.
- Analysis of vehicle design and test of vehicle components to determine compliance with federal standards.
- Research and development covering design of vehicle components and safety equipment.
- Design, construction, and test of experimental safety vehicles.
- Preparation and dissemination of consumer information publications, films, and exhibits.
- Continuous revision of safety standards.

Automobile manufacturers are required to identify safety defects in vehicles, to notify owners, and to recall vehicles for correction of defects.

Highway and Traffic Engineering

The student should know the impact of improved highway design and traffic engineering upon the inherent safety of the roadway, and ability of the roadway to provide safe and expeditious travel.

America's 111 million drivers are serviced by nearly 4 million miles of highway, nearly half of which is surfaced with asphalt or concrete materials that permit safe all-weather travel. These roads supported over 1,125 billion vehicle miles of travel in 1970. Efforts are continually being devoted to designing new highways and controlling traffic over existing highways in such a way as to provide not only safe driving conditions but the widest possible margin for driver error.

Highway Design

A major stimulus to the construction of new modern highways was the passage in 1956 of the Federal Aid Highway Act under which some 41,000 miles of high speed interstate highway will soon have been completed. The modern design of the roadways that constitute the Federal Interstate System allows a large number of vehicles to travel at high rates of speed in relative safety. It is the increased number of miles travelled on these highways that, more than any other single factor, has been responsible for the gradual decline in the motor vehicle death rate (deaths per million miles) throughout the past half century.

Highway design features that have improved safety of vehicle operation include the following:

Construction of four or more lanes to permit passing without hazard from oncoming traffic.

Separation of opposing lanes of traffic through median dividers.

Increased sight distance through reduction in the number and severity of curves, hills, and dips.

The use of underpasses and overpasses to separate traffic on intersecting highways.

Design of highway interchanges (e.g., cloverleaf) in such a way as to permit vehicles to attain or maintain highway speeds before entering or exiting.

Use of surface materials that provide better traction under various weather conditions.

Improved lighting, particularly near interchanges, to illuminate roadway configurations, signs, and traffic.

Wider and better-constructed shoulders to permit vehicles to leave the roadway without interfering with other traffic.

Improved design and location of signs, light standards, and other potentially hazardous objects along the roadway.

Decreased rate of curvature and improved banking in curves.

Better guardrails to prevent cars from leaving the roadway.

Removal of embankments and ditches alongside the roadway.

Traffic Engineering

While a great deal of driving takes place on modern Interstate highways, these highways account for less than 2% of the total mileage of American roadways. Most of the roadway system is comprised of the state and county highways and city streets upon which the majority of everyday driving takes place. Improved safety on existing roadways is achieved primarily by the manner in which the flow of traffic is regulated. The regulation of traffic, the province of traffic engineering, is achieved by the following means:

Selecting lanes that are allowed to move. Traffic signals and police officers may select and regulate the lanes of traffic that are allowed to move. Such controls must be synchronized with one another so as to minimize the interruption of traffic flow.

Assigning priorities to different lanes of flow. Stop signs and yield signs identify which lanes of flow have the right of way and are of particular value where roadway design does not make clear which is the "main" roadway.

Controlling maneuvers. Lights, signs, and land markings indicate which maneuvers may or may not be made (e.g., "no left turn") or the points at which maneuvers may and may not be made. Directions must be clear and unambiguous if they are to prevent confusion and resulting accidents.

Controlling direction. Use of one-way signs to control the direction of travel may reduce accidents as well as improve the rate of flow. However, the likelihood of certain types of accidents may be increased where the one-way direction of travel conflicts with expectations (e.g., pedestrians looking the wrong way when stepping into the street).

Controlling speed. The speed at which traffic flows can be controlled to some extent by speed limits and the timing of traffic signals. In addition, anything that tends to interrupt traffic flow, such as a traffic signal or stop sign, will tend to reduce speed. Control of speed must involve a balance of safety considerations with expeditious traffic flow. Anything that controls speed will also have an effect upon traffic volume since drivers will tend to prefer those routes that are fastest.

Controlling path of travel. The traffic engineer may use channels, islands, barriers, circles, and lane markings to control the path the vehicle travels in such a way to limit the amount of vehicle conflict thereby reducing hazard and expediting flow.

Controlling parking. The locations and times at which on-street parking is permitted will influence the capacity of a given street and therefore the flow of traffic. Also, because vehicles entering and leaving parking spaces tend to disrupt the flow of traffic, the amount of on-street parking also influences safety.

Controlling pedestrian traffic. By specifying the points at which pedestrians may cross the street and providing such aids as crosswalks and pedestrian tunnels and overpasses, the traffic engineer may limit the disruption and hazard involved in the conflict between vehicle and pedestrian traffic.

Providing information. In addition to his control functions, the traffic engineer also provides information to drivers concerning such matters as route numbers and destinations, potential hazards, and available services. The manner in which information is displayed, its clarity and intelligibility to the driver, will influence both the nature of vehicle maneuvers and the attention to which the driver can devote to them.

Effective traffic engineering must be supported by a variety of research and development activities related to (1) the capabilities and tendencies of drivers and pedestrians, (2) vehicle operating characteristics, (3) normal traffic characteristics, and (4) the nature and location of traffic accidents. As an aid to traffic engineering, the U.S. Department of Transportation supports a number of research and development projects and each of the areas cited. One important aspect of the federal program is encouragement of standardization for traffic control devices, signals, markings, and so on, as a means of improving the motorist's ability to respond appropriately to the signals he encounters throughout the country. The "Manual on Uniform Traffic Control Devices for Streets and Highways" prepared by the U.S. Department of Transportation is an element in this program.

SOURCE MATERIALS

American Automobile Association, *Teaching Driver and Traffic Safety Education*, McGraw-Hill Book Company, New York, 1965, pp. 291-421.

American Association of Motor Vehicle Administrators, *Driver License Compact*, American Association of Motor Vehicle Administrators, Washington, D.C., 1963.

American Association of Motor Vehicle Administrators and Committees on Motorists' Vision and Highway Safety of the American Optometric Association, *Vehicle Screening for Driver Licensing*, American Association of Motor Vehicle Administrators, Washington, D.C.; Optometric Association, St. Louis, Missouri, May 1966.

American Association of Motor Vehicle Administrators, *Testing Drivers: A Manual for Driver License Administrators and Examiners*, American Association of Motor Vehicle Administrators, Washington, D.C., 1967.

Baerwald, J.E., Ed., *Traffic Engineering Handbook*, Institute of Traffic Engineers, Washington, D.C., 1965.

Malany, L.L., et al. *Basic Training Program for Driver License Examiner: Instructor Lesson Plans*, National Highway Traffic Safety Administration, U.S. Department of Transportation, Washington, D.C., U.S. Government Printing Office Stock No. 5003-0049, August 1971.

National Committee on Uniform Traffic Laws and Ordinances, *Uniform Vehicle Code and Model Traffic Ordinance*, National Committee on Uniform Traffic Laws and Ordinances, Washington, D.C., Revised 1968.

National Highway Safety Bureau, *Highway Safety Program Standards*, National Highway Safety Bureau, Department of Transportation, Washington, D.C., 1969.

U.S. Department of Transportation, *Manual on Uniform Traffic Control Devices*, Federal Highway Administration, U.S. Department of Transportation, Washington, D.C., Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., Stock Number 5001-0021, 1971.

Part II

FUNCTIONS OF DRIVING SCHOOL INSTRUCTION

A

Objectives of Driving Instruction

The client of a driving school often enters instruction in the hope of acquiring enough skill to pass a license examination. The objectives of the school in providing the instructor must be broader, however, if the highway transportation system is to function effectively. Each driver must be prepared to operate his or her automobile effectively. It must be the objective of all who provide driving instruction to see that their students are so prepared. Every businessman must meet the demands of his clients. If he wants his business to endure he must also attempt to meet the needs of his clients—needs to which the clients are often oblivious.

EFFECTIVE DRIVING

Skillful, effective driving demonstrates the ability to get from one place to another rapidly, comfortably, economically, and, above all, safely. As a criterion of effectiveness, safety outstrips all others. The annual costs of highway accidents—property damage, injury, lost income, pain and suffering—far exceed costs associated with other aspects of ineffective driving. Moreover, while the effects of other factors are almost totally confined to the individual who is driving, safety affects others as well—passengers, other motorists, pedestrians.

As safety is paramount to driving effectiveness, it should become the focal point of driving instruction. An instructor may overlook far more easily a tendency to ride the accelerator, or a tendency to pull away too abruptly, or a tendency to hesitate in tight quarters, than he can overlook failure to check cross traffic, forgetting signal turns, or pulling out without looking back.

STATE AND FEDERAL REQUIREMENTS

Few governmental requirements are imposed directly on instruction that driving schools may offer. Most of the controls that are exercised relate to the qualifications of instructors, financial responsibility, and other non-curricular matters. However, the nature of instruction provided to certain groups of students may be subject to controls imposed on the students. Professional driving instructors teaching under contract to public schools should conform to the requirements of the school system. Many states require license applicants between 16 and 18 years of age to complete an "approved" course of instruction before being granted a license. If driving schools are to be "approved" they should meet the same requirements and standards as other schools.

The requirements of most states are patterned after the Highway Safety Program Standards of the National Highway Traffic Safety Administration (NHTSA). The standards set forth the following minimum requirements for a safety-oriented program:

> Basic and advanced driving techniques including techniques for handling emergencies.
>
> Rules of the road, and other state laws and local motor vehicle laws and ordinances.
>
> Critical vehicle systems and subsystems requiring preventive maintenance.
>
> The vehicle, highway, and community features that aid the driver in avoiding crashes, protect him and his passengers in crashes, and minimize the extent of injuries in the event of accidents.

Signs, signals, and highway markings, and highway design features which require understanding for safe operation of motor vehicles.

Differences in characteristics of urban and rural driving, including safe use of modern expressways.

Pedestrian safety

Driving schools intending to administer instruction under state programs must take these minimum content requirements into consideration. In addition, state regulations dictate that certain specific objectives must be fulfilled before the driving schools will be accredited. These regulations include:

A specified number of clock hours of instruction for classroom and behind-the-wheel training that exceed the nationally recommended minimum standards.

The number of clock hours of simulator instruction, driving range instruction, or observation time that may be substituted for a portion of behind-the-wheel training.

B

The Driving Instructor

The student should know the qualifications and requirements for driving school instructor certification.

There is little uniformity across the country in the qualifications required of driving instructors. Some states impose almost no special requirements while at least one state requires instructors to meet the same requirements as secondary school driver educators.

RECOMMENDED STANDARDS FOR DRIVING INSTRUCTORS

The National Professional Driver Education Association (NPDEA), an organization of professional driving instructors, is directing its efforts toward establishing and maintaining a highly qualified work force. In addition to adopting a recommended course outline for training instructors, the NPDEA has indicated that instructors should meet certain requirements for qualification and certification. The Association's recommendations include:

Graduation from an accredited secondary school.

No physical impairments which would affect ability to operate a motor vehicle and to train others to do so. A medical report should be an integral part of the license application.

A license from the state allowing him to give driving instruction for hire or tuition.

A valid operator's or chauffeur's license and no more than two moving violations or one chargeable accident within the preceding two years.

Ability to pass any examination that the state requires on traffic laws, safe driving practices, operation of motor vehicles, and qualifications of driver training instructors.

Minimum age of 25 years.

In general, the driving school industry supports the establishment of standards for instructor qualifications. However, such standards, it is contended, should relate to specific skills required in driving instruction and not involve the more general academic credentials such as the need for a college degree. Several states have established requirements which follow this approach. For example, Massachusetts requires behind-the-wheel instructors to complete a state-approved 45-hour basic course in driver education, and classroom instructors to complete an additional 45-hour advanced course.

DRIVING SCHOOL INSTRUCTOR FUNCTIONS

One purpose of this Guide is to identify a set of skills and knowledges appropriate to driving instruction—skills and knowledges that might help to make up a set of required instructor qualifications. However, before it is possible to deal with instructor qualifications, it is necessary to determine just what the instructors must do. Certainly, the driving instructor must teach. However, there are other functions he must perform.

To determine what these other functions were, a survey was conducted among a number of the nation's leading driving schools. Respondents were asked to identify from a list of educational functions those they believed were appropriate to professional driving instructors. The functions identified include the following major categories:

Accepting New Students

Greeting new students.

Interviewing new students briefly to ascertain the extent of their driving experience.

Arranging for acquisition of driving permits, if necessary.

Distributing written course materials and appropriate forms.

Developing Instructional Materials

Identifying appropriate instructional objectives.

Selecting and organizing content.

Selecting classroom methods and teaching aids.

Determining applicable legal requirements and school policies.

Preparing lesson plans and student materials.

Scheduling Instruction

Scheduling individual and classroom instruction in accordance with school policies.

Reporting cancellations or schedule changes.

Administering Instruction

Presenting information and managing classroom activities.

Administering simulator instruction and other forms of classroom practice activities.

Conducting behind-the-wheel instruction, on-road and off-road.

Evaluating Progress

Evaluating progress of individual students through observation, interview, and development and administration of tests.

Identifying specific weaknesses of students and instructional materials.

Preparing Students for License Examination

Determining whether the student has all the necessary certificates and forms.

Assuring that the student has mastered the skills and knowledges covered by the test.

Helping the student to anticipate specific knowledges and skills to be tested, including giving the student a "dry run."

Arranging to transport the student to the test site, in keeping with school policy.

Assisting in identifying specific weaknesses if the student fails the test.

Maintaining Records

Maintaining records of student attendance and achievement.

Providing students with certificates of course completion for licensing and insurance purposes.

Assuring that automobiles, student drivers, and instructors are properly insured.

Collecting Fees

Collecting fees for lessons and providing students with receipts for payment.

Turning in fees and appropriate records to the office, in accordance with the school policy.

Maintaining Automobiles and Equipment

Assuring that automobiles are maintained in good operating condition in accordance with laws and regulations of the state.

Participating in Community Activities

Participating in educational and highway safety activities of the community in support of improved highway safety.

Improving Instructional Competence

Attending graduate and technical courses to enhance knowledge of traffic safety.

Participating in professional meetings.

Surveying literature on a regular basis to keep abreast of the availability of new materials, development of new instructional techniques, and publication of research findings.

These functions represent a broad spectrum of activities. Nonetheless, each activity plays a role in the achievement of the driving instructor's ultimate goal, that is, endowing new drivers with the skills and knowledges needed for safe entry into the highway transportation system.

The rest of Part II of this Guide will deal with the qualifications driving instructors need to carry out the functions described above. More specifically, the remainder of this section, Section B will discuss the functions concerned with improving professional competence. Section II-C, Curriculum Development, will deal with the qualifications needed to develop effective instructional materials. Section II-D, Curriculum Administration, will deal with the administrative functions involved in driving instruction, including scheduling and administering instruction, student evaluation, maintaining records, collecting fees, maintaining automobiles and equipment, and participating in community activities.

INSTRUCTOR QUALIFICATIONS

The professional qualifications dealt with in this Guide go far beyond those possessed by the great majority of driving instructors in practice today. It is apparent that the operators of driving schools, in responding to the survey of instructor functions, were not describing a state of affairs that presently exists but rather a goal for the future. They called for competence in administering simulator instruction, conducting group discussions, and developing driving ranges—all approaches that are little used in driving schools today. On the whole, the functions described by operators of driving schools as appropriate to professional driving instructors differed little from those that are set forth for secondary school driver educators.

In support of expanding and upgrading professional competence within driving schools, the following points may be made:

1. Many operators of driving schools wish to provide instruction under state-operated programs, including programs within the state secondary school system and programs

leading to the acquisition of certificates of course completion for licensing purposes. Schools will not be eligible to participate in such programs unless their personnel and facilities meet state requirements.

2. If driving schools are to represent an effective complement to secondary school programs, they must compete on an equal footing. Equality cannot be achieved, in the eyes of governmental agencies or the public at large, unless their instructors are every bit as "professional" as those in secondary schools, colleges, or commercial fleets.
3. In several countries, such as Japan, Canada, and England, professional driving instruction is the predominant form of student preparation. In these countries, the capabilities of schools, including the qualifications of instructors as well as the nature of facilities, represent all of the capabilities discussed in this Guide.

Beyond his technical capabilities, the driving school instructor must be suited, both physically and psychologically, for his profession. He should have a genuine interest in teaching people to drive. He should be sufficiently mature and even tempered to cope with the extreme demands of driving and of teaching students who will present a wide range of learning problems. Many people obtain the services of a driving school instructor only after having failed to learn through other approaches.

In addition to being an effective teacher, the driving school instructor must be a skillful and careful driver. His own driving practices must be congruent with those he is attempting to inculcate in his students. His own driving record must be relatively free of violations and accidents, both on and off the job.

METHODS OF MAINTAINING PROFESSIONAL COMPETENCE

The student should know the various means of maintaining and furthering his professional competence in the field of driver education and traffic safety.

The principal source of competence for today's driving instructor is generally the driving school that employs him. Generally, only the largest schools maintain a teaching staff to which the driving instructor may turn for help in furthering his professional competence. As states enact legislation dealing with the qualifications of supervisor instructors, the ability of the driving instructor to obtain help from this source should improve. However, even the largest and most progressive driving schools may find difficulty in maintaining a permanent teaching staff with the breadth of knowledge required to further the professional competence of driving instructors. Some schools have turned to local colleges or even high schools for personnel to administer in-service educational programs.

Each driving instructor should be prepared to engage in those educational activities that will result in the continual upgrading of his professional competence.

COLLEGE-LEVEL INSTRUCTION

One does not need to be a college graduate to teach others to drive. However, colleges provide a useful source of education for driving instructors who wish to improve their professional competence.

Efforts are under way now to encourage junior colleges to institute career programs for driving school instructors. These junior college programs would provide the same level of technical instruction in traffic safety education as is provided in most four-year college programs.

Driving instructors not requiring or not wishing to take full driver education teacher preparation programs may wish to improve their general professional competence by taking courses under adult education programs at nearby colleges or universities.

Some colleges and universities may offer correspondence courses for driver education teachers, often granting credit toward a degree. A recently compiled list of colleges and universities offering courses in driver education and traffic safety will be found at the end of this section.

Undergraduate courses can include electives in the behavioral sciences and traffic safety such as sociology, social psychology, behavior of youth, attitude development, law enforcement, traffic engineering, legislation and licensing, state and local government, traffic management, and community support.

Driving instructors may be given the opportunity to attend refresher conferences, workshops, and professional conferences and institutes. These activities provide instructors with the latest teaching developments and research findings in the field and the opportunity to discuss mutual problems and exchange individual experiences and ideas.

Two national conferences are held annually which may offer many benefits to driving instructors. They are the annual conference of the National Professional Driver Education Association (NPDEA) and the National Safety Congress sponsored by the National Safety Council.

In addition to the two national conferences, instructors can attend various meetings at the state and local levels. State professional associations provide an opportunity for driving instructors to participate in programs designed to meet particular needs and interests. State agencies, such as the motor vehicle administration, department of public instruction, or the governor's office, sponsor meetings and conferences of interest to driver educators.

Many organizations and agencies often conduct workshops, some highly specialized, some one-day affairs or a series of one-day meetings held in various parts of the state, permitting a greater number of teachers to attend and participate.

Following is a list of conferences and workshops conducted for driver education instructors:

Governor's Annual Safety Conference and Exposition.

Annual meeting of the Highway Users Federation for Safety and Mobility.

National Safety Council workshops.

State and regional conferences.

State highway engineering conferences.

Workshops and seminars sponsored annually by various associations.

Regional traffic court conferences.

Regional meetings of the State Highway Officials Association.

Summer school sessions on specific subjects at colleges and universities.

PROFESSIONAL LITERATURE

Publications

Because driver education is a relatively new discipline, it is changing and developing constantly. Research is being carried out by interested and involved individuals and organizations all over the country. Newly-trained instructors with new ideas are expressing themselves in publications concerned with driver instruction. And the established leaders in the field continue to work for the improvement of driver education, sharing their opinions in speeches at various conferences and through articles in journals and periodicals. Often, these articles will provoke a written response from readers which can be as enlightening as the articles themselves.

Many of the driver education publications have a section on new books, reports, and articles concerning driving instruction. A listing of the title, author, name and address of publication or publisher, and date of publication makes it possible for readers to order reprints. These sections have various standing headlines and are easily located (for example, Traffic Safety's "The Safety Library").

In addition to this reader information, some periodicals have their own year-end index which lists by subject matter all of the articles published in the magazine during the year.

Driving instructors should work toward building their own reference library by purchasing books, and subscribing to magazines and other printed materials. Some publications are directed specifically at the driver education teacher; others concentrate on disciplines related to driver education.

Suggested publications, listed in three different categories, appear at the end of this section.

Professional Papers and Theses

Other sources of current professional literature are papers written by graduate students in driver education and traffic safety for their advanced degrees. A copy of any dissertation can be secured by writing to University Microfilms, Box 1346, Ann Arbor, Michigan. The order must include the author and the year the paper was written. Indicating the number assigned to the paper will expedite receipt of the document.

Books

The driving instructor should be familiar with the recent books on the subject. Many of them are textbooks for high school students, with an accompanying teacher's manual. A few have been written to assist the instructor with such elements of the program as in-car instruction, curriculum, and teaching aids and equipment.

Sources for Additional Written Material

There are many organizations with an interest in driver education and traffic safety that can assist the driving instructor by providing various types of printed material, such as brochures, pamphlets, periodicals, and technical reports. The names and addresses of some of these organizations follow:

AEtna Life and Casualty Company, Driver Education Services Section, 151 Farmington Avenue, Hartford, Connecticut 06115.

Allstate Insurance Company, Driver Education Section, Allstate Plaza, Northbrook, Illinois 60062.

American Association of Motor Vehicle Administrators, 1828 L Street NW, Washington, D.C. 20036.

American Automobile Association, 1712 G Street NW, Washington, D.C. 20006.

American Manufacturers Association, 320 New Center Building, Detroit, Michigan 48202.

American Medical Association, 535 North Dearborn Street, Chicago, Illinois 60610.

Council for Exceptional Children, National Education Association, 1201 16th Street NW, Washington, D.C. 20036.

Ford Motor Company, Automotive Safety Research Office, Dearborn, Michigan 48121.

General Motors Corporation, Warren, Michigan 48090.

Highway Research Board, National Academy of Sciences, 2101 Constitution Avenue NW, Washington, D.C. 20418.

Highway Users Federation for Safety and Mobility, 1776 Massachusetts Avenue NW, Washington, D.C. 20036.

Insurance Institute for Highway Safety, Suite 300, 600 New Hampshire Avenue NW, Washington, D.C. 20037.

Private Truck Council of America, 1317 F Street NW, Washington, D.C. 20004.

The Travelers Research Center, Hartford, Connecticut.

State Department of Motor Vehicles in the state capital.

State Department of Public Instruction, in the state capital.

*U.S. Department of Health, Education, and Welfare, Washington, D.C.

*U.S. Department of Transportation: Federal Highway Administration; also National Highway Traffic Safety Administration, Washington, D.C. 20402.

TEXTUAL MATERIALS

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, Fifth Printing, The MacMillan Company, New York, New York, 1966.

American Automobile Association. *Teaching Driver and Traffic Safety Education*. McGraw-Hill Book Company, New York, 1965.

Anderson, William G. *In-Car Instruction: Methods and Content. A Manual for Teachers of Driver and Traffic Safety Education*, Addison-Wesley Publishing Company, Reading, Massachusetts, 1968.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, Prentice Hall, Inc., Englewood Cliffs, New Jersey, 1954.

Center for Safety Education, New York University. *Man and the Motor Car*, Sixth Edition, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1962.

Insurance Institute for Highway Safety. 21st Annual Driver Education Achievement Program, 1967-1968 School Year, 600 New Hampshire Avenue NW, Washington, D.C.

SUGGESTED PUBLICATIONS

The first group provides direct interest to driving instructors:

Air Force Driver, published monthly by the Department of the Air Force, Subscription available through the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Subscription price—$2 per year.

Driver Training, Published quarterly by the North American Professional Driver Education Association, PO Box 27368, San Francisco, Calif. 94127.

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*Requests for specific documents should be addressed to the Superintendent of Documents, Government Printing Office Washington, D.C. 20402.

SUGGESTED PUBLICATIONS (Continued)

Highway Research News, published quarterly by the National Academy of Sciences, Highway Research Board Publications Office, 2101 Constitution Avenue NW, Washington, D.C. 20418. Subscription price–$5 per year.

Journal of Traffic Safety Education, published quarterly by, and is the journal for, the California Driver Education Association; also the official voice of American Driver and Traffic Safety Education Association (ADTSEA). Membership in ADTSEA includes a subscription to this journal. Nonmember subscriptions at $4.00 per year can be obtained from Roger Lake, Subscription Editor, 413 Dahlia, Corona del Mar, California 92625.

School Safety, published quarterly by the National Safety Council, 425 North Michigan Avenue, Chicago, Illinois 60611. Subscription price–$3.60 per year.

Traffic Safety, published monthly by the National Safety Council, 425 North Michigan Avenue, Chicago, Illinois 60611. Subscription price–$5.60 per year.

This second group of publications is informative but rather technical:

Educational Technology, 140 Sylvan Avenue, Englewood Cliffs, New Jersey 07632. Subscription price–$18.00 per year.

Perceptual and Motor Skills, published bimonthly; Box 1441, Missoula, Montana 59801. Subscription price–$40.00 per year.

Transportation Research, published quarterly by Pergamon Press, Maxwell House, Fairview Park, Elmsford, New York 10523. Subscription price–$40.00 per year.

The publications in this last group are highly technical in fields related to driver education:

Applied Ergonomics, published quarterly by IPC House, 32 High Street, Guildford, Surrey, England. Subscription price–$25.00 per year.

Educational and Psychological Measurement, published quarterly; Box 6907, College Station, Durham, North Carolina 27708. Subscription price–$10.00 per year.

Human Factors, published bimonthly by the Human Factors Society. The John Hopkins Press, Baltimore, Maryland 21212. Nonmember subscription price–$20.00 per year.

International Journal of Man-Machine Studies, published four times yearly by Academic Press, Inc., 111 Fifth Avenue, New York, New York 10003. Subscription price–$26 per year.

Instructional Technology, published bimonthly by Girard Associates, Inc., Box 455, Mt. Arlington, New Jersey 07856. Subscription price–$30.00 per year.

Journal of Applied Psychology, published bimonthly by the American Psychological Association, 1200 Seventeenth Street NW, Washington, D.C. 20036. Subscription price–$2 per issue; $10.00 per volume.

Journal of Experimental Psychology, published monthly by the American Psychological Association, 1200 Seventeenth Street NW, Washington, D.C. 20036. Subscription price–$50 per year.

Journal of Motor Behavior, published quarterly; 726 State Street, Santa Barbara, California 93101. Private individual subscriber rate–$8 per year.

INSTITUTIONS OF HIGHER EDUCATION OFFERING MINOR OR MAJOR IN SAFETY EDUCATION

Institution	MINOR			MAJOR		
	Bachelor's	Master's	Doctorate	Bachelor's	Master's	Doctorate
Arizona State University Tempe, Arizona	X	X			X	
University of Arizona Tucson, Arizona	X					
California State College Long Beach California	X					
California State College Los Angeles, California	X					
Fresno State College Fresno, California	X	X		X	X	
Sacramento State College Sacramento, California	X					
Adams State College Alamosa, Colorado	X					
Colorado State University Fort Collins, Colorado		X			X	
Southern Connecticut State College New Haven, Connecticut					X	
University of Georgia Athens, Georgia					X	
Idaho State University Pocatello, Idaho	X	X				
Eastern Illinois University Charleston, Illinois	X					
Illinois State University Normal, Illinois	X	X	X	X	X	
Northern Illinois University DeKalb, Illinois	X	X			X	
Quincy College Quincy, Illinois	X					
Southern Illinois University Carbondale, Illinois	X	X	X	X	X	X
Southern Illinois University Edwardsville, Illinois	X	X				
University of Illinois Urbana, Illinois	X			X		
Western Illinois Macomb, Illinois	X					
Indiana State University Terre Haute, Indiana	X	X		X	X	
Manchester College North Manchester, Indiana	X					
Purdue University Lafayette, Indiana		X				
Iowa State University Ames, Iowa	X	X	X			
University of Dubuque Dubuque, Iowa	X					
Fort Hays Kansas State College Hays, Kansas	X					
Kansas State Teachers College Emporia, Kansas	X					
Western Kentucky University Bowling Green, Kentucky		X				
Louisiana State University Baton Rouge, Louisiana	X					
Towson State College Towson, Maryland	X					
University of Maryland College Park, Maryland	X					
Michigan State University East Lansing, Michigan	X			X	X	
Northern Michigan University Marquette, Michigan	X	X				
Mankato State College Mankato, Minnesota	X					
Central Missouri State College* Warrensburg, Missouri	X	X		X	X	
Northeast Missouri State College Kirksville, Missouri	X			X		
Northwest Missouri State College Maryville, Missouri	X			X		
Southwest Missouri State College Springfield, Missouri	X					
Chadron State College Chadron, Nebraska	X					
Kearney State College Kearney, Nebraska	X					
Peru State College Peru, Nebraska	X					
Wayne State College Wayne, Nebraska	X					
Western New Mexico University Silver City, New Mexico					X	
Brooklyn College of the City University of New York Brooklyn, New Yory					X	
New York University New York, New York		X	X		X	X
Miami University Oxford, Ohio	X					
Central State College Edmond, Oklahoma	X			X		
Oklahoma State University Stillwater, Oklahoma	X	X				
University of Oregon Eugene, Oregon	X	X		X		
East Stroudsburg State College East Stroudsburg, Pennsylvania	X					
Edinboro State College Edinboro, Pennsylvania				X	X	
Geneva College Beaver Falls, Pennsylvania	X					
Indiana University of Pennsylvania Indiana, Pennsylvania				X		
University of Pittsburgh Pittsburgh, Pennsylvania					X	
University of Tennessee Knoxville, Tennessee		X	X		X	
University of Houston Houston, Texas	X					
Central Washington State College Ellensburg, Washington	X					
Marshall University Huntington, West Virginia				X		
Shepard College Shepherdstown, West Virginia	X					
West Virginia State College Institute, West Virginia	X					
West Virginia University Morgantown, West Virginia						X
West Liberty State College West Liberty, West Virginia	X					
Stout State University Menomonie, Wisconsin	X					
University of Wisconsin Madison, Wisconsin			X		X	X
Wisconsin State University Oshkosh, Wisconsin	X					
Wisconsin State University Platteville, Wisconsin	X			X		
Wisconsin State University Whitewater, Wisconsin	X					
	31	18	6	15	18	4

* Also Specialist Degree Offered

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DRIVER & SAFETY EDUCATION COURSES

–a survey of colleges and universities

by Paul O. Carr

Paul O. Carr is retired president of the District of Columbia Teachers College. A former member of the NEA National Commission on Safety Education, he now serves as a consultant to the Commission.

More than 1,100 courses in driver and safety education, or related courses, were submitted by 256 colleges and universities in this survey. Of these courses, 749 will be offered during the 1970 summer sessions. The courses, where indicated, show that 469 are undergraduate, 211 are graduate, and 370 may be taken for either undergraduate or graduate credit.

The NEA Commission on Safety Education, with the assistance of personnel in the state departments of education, conducted this survey. Information on courses and degrees was received from colleges and universities in 46 states and the District of Columbia. Not all of the institutions of higher education within the states submitting reports are included in this survey, but the returns received are representative of the course offerings in driver and safety education and in related areas of study for 1969-70.

Fifty-five institutions offer a bachelor's degree program, 27 a master's degree program, and 4 a doctor's degree program for either a major or a minor or both in driver and safety education.

The courses deal primarily with teacher preparation, accident prevention, supervision and administration, and special problem areas in traffic safety. A majority of them offer 3 semester hours credit.

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INSTITUTIONS OF HIGHER EDUCATION OFFERING COURSES IN DRIVER AND SAFETY EDUCATION . . . .
A LISTING BY STATES FOR 1969-70

Important: Unless otherwise indicated all courses are offered annually.
Offered occasionally*
Offered as extension service**

When Offered:
1—1st semester
2—2nd semester
3—fall quarter
4—winter quarter
5—spring quarter
6—summer

Credit hours and level:
Semester credits unless indicated by a "q" (quarter)
U—undergraduate G+graduate B—both U and G

	When Offered	Credit Hours & Level	Weeks
ALASKA			
No courses are presently offered in Alaska's institutions of higher learning "in teacher preparation programs designed to develop teachers of Driver Education or Safety Education."			
ARIZONA			
Arizona State University, Tempe			
Driver Education I, II	1, 2, 6	3 B	16–5
Industrial Hygiene	1, 6	3 B	16–5
Industrial Hygiene II	2	3 B	16
Organ. & Admin. of Driver & Safety Education	1, 6	3 B	16–5
Pro-Seminar Transportation Safety	1, 6	3 B	16–5
Safety Education	1, 2, 6	3 B	16–5
Two-Wheeled Motor Vehicle Safety	6	3 G	5
Northern Arizona University, Flagstaff			
Driver Education	1, 2, 6	3 B	18–5
Safety Education	1, 2, 6	3 B	18–5
University of Arizona, Tucson			
Safety Education	2	3 B	16
Safety & Traffic Education	1, 2, 6	3 B	16–5
ARKANSAS			
Arkansas State University, Jonesboro			
Driver Education—Beginning	6	3 U	10
Driver Education—Advanced	6	3 U	10
Arkansas Polytechnic College, Russelville			
Driver & Traffic Education I	1, 2, 6	3 U	18
Driver & Traffic Education II	1, 2, 6	3 U	18
State College of Arkansas, Conway			
Driver Education	6	2 U	2
Advanced Work in Driver Education	6	2 U	2
University of Arkansas, Fayetteville			
Driver Education (Organ. & Adm. Program)	1	3 B	18
Workshop in Driver Education (Problems, Legislation, and New Developments)	6	3 B	6
CALIFORNIA			
California State College, Long Beach			
Admin. & Supervision of Driver Education Programs	1, 6	2 B	18
Automotives I	1, 2	2 U	18
Driver and Traffic	1, 2, 6	2 B	18
Driver & Traffic Safety Education I Laboratory	1, 2, 6	1 B	18
Driver & Traffic Safety Education II	1, 2, 6	2 B	18
Driver & Traffic Safety Education II Laboratory	1, 2, 6	1 B	18
Driving Simulators	1, 2, 6	2 B	18
Driving Simulators Laboratory	1, 2, 6	1 B	18
Elem. & Sec. School Safety	1	2 B	18
First Aid	1, 2, 6	2 U	18
Industrial Safety	1, 2, 6	2 B	18
Police Field Operations	1, 2	3 U	18
Public Safety	1, 2, 6	2 B	18
School Emergency Procedures	2	2 B	18
Stimulants and Depressants	1, 2, 6	3 B	18
Traffic Engineering	1	3 B	18
Traffic Laws and Procedures	1, 6	3 B	18
California State College, Los Angeles			
Accident & Safety Studies	3, 4, 5	2q U	12
Advanced Studies in Traffic & Safety Education	3, 4, 5	4q G	12
Driver Education Curriculum	3, 4, 5	2q U	12
Driver Training Program	3, 4, 5	2q U	12
Legal Aspects of Driver Education & Driver Training	3, 4, 5	4q G	12
Organ. & Supervision of Safety & Driver Instruction Programs	3, 4, 5	2q U	12
Traffic Simulator Instruction	3, 4, 5	2q U	12
California State Polytechnic College, San Luis Obispo			
Safety Education Prin. & Practices of Safety as Applied to Home, School, Community & Traffic Situations & Accident Prevention	3	3q U	11
Chapman College, Orange			
Accident Prevention: Public Safety	*2	3 B	18
Chico State College, Chico			
Advanced Driver Education	2	3 B	18
Basic Driver Education	1, 2	3 B	18
Driver Education	1, 2	3 B	18
Psychology of Traffic Safety	6	3 B	18
Public Safety & Accident Prevention	1	3 B	18
Fresno State College, Fresno			
Driver Education Training	1, 2, 6	3 U	15
First Aid	1	2 U	15
Field Work Health	1	1 G	15
Safety Problems Program	1	2 G	15
Safety Education	1, 2, 6	3 U	15
Teaching First Aid	2	1 U	15
Humboldt State College, Arcata			
Conservation of Human Resources	3, 4	4q B	12
Driver Instruction in Sec. Sch.	3, 5	3q B	12
Problems & Practices in Driver Training	4, 5	3q B	12
Simulator in Driver Instruction	4, 5	3q B	12
Student Teaching in Sp. Fields	4, 5	3q B	12
Pacific Union College, Angwin			
Driver Education	5	3q B	12
Safety Education	3, 6	3q B	12
Pepperdine College, Los Angeles			
Alcohol and Narcotics Education	1, 6	3 B	14
Behavioral Factors in Traffic Safety	2	3 B	14

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	When Offered	Credit Hours & Level	Weeks
Driver Education	2	3 B	14
Driver Training & Simulation	1, 6	3 B	14
Public Safety & Accident Prevention	2	3 B	14
Sacramento State College, Sacramento			
Foundations of Safety & Accident Prevention	1, 2, 6	3 U	16
Driver & Traffic Safety Education I	2, 6	3 U	16
Driver & Traffic Safety Education II	1, 2, 6	3 U	16
Introduction to Driver Simulation	1, 2	1 U	16
Laboratory for Behind-the-Wheel Driving	1, 2	1 U	16
Organ. & Admin. of Sec. Driver Instruction	2	2 U	16
San Diego State College, San Diego			
Admin. & Trends in Traffic Safety Education	2	3 G	16
Advanced Driver Education & Driver Training	1, 2, 6	3 U	16
Instructor's Course in First Aid	1, 2, 6	3 U	16
Introduction to Traffic Safety	1	3 U	16
Multi-Media Techniques in Driver Instruction	1, 2, 6	3 U	16
Safety Education & Accident Prevention	1, 2, 6	3 B	16
School Safety Programs & Procedures	2	3 G	16
Traffic Safety & Driver Education	1, 2, 6	3 U	16
San Francisco State College, San Francisco			
Advanced Driver Education	2, 6	[illegible] B	18
Curriculum & Instruction in Health & Safety Education	1, 2	2 B	18
Driver Instruction Programs	1, 6	3 B	18
Driver Training & Driver Simulation	1, 2	2 B	18
Elementary School Safety	1, 2, 6	3 B	18
Emergency Procedures	1, 2	1 U	18
Inovations in Driver Education	6	1 B	1
Introduction to Driver Education	1, 2, 6	2 B	18
Life Saving & Water Safety	1, 2	1 U	18
Safety & Accident Prevention	1, 2, 6	3 B	18
Teaching with Driving Simulators	4	1 B	1
Theory & Practice in Adv. Swimming Life Saving & Water Safety	1, 2	2 B	18
Water Safety Instruction	1, 2	1 U	18
San Jose State College, San Jose			
Accident Prevention & Safety Education	1, 2	2 B	
Driver Education: Classroom	1, 2	3 B	
Driver Education: Practicum	1, 2	3 B	
Driver Education: Simulation	1, 2	2 B	
Introd. to Driver & Traffic Safety Education	1, 2	2 B	
University of California, Davis			
Defensive Driver Training		0	1
University of California, San Diego			
Driver & Safety Education			
COLORADO			
Adams State College, Alamosa			
Admin. of Driver Education Programs	6	3q G	—
Advanced Driver Education	5, 6	3q B	10
Basic Driver Education	3	3q B	10
Curr. Development for Driver Education	5	3q G	—
Driver Education	3, 6	3q B	10
Safety Education	4, 6	3q B	10
Simulator & Multiple-Car-Driver Range	6	3q G	—
Colorado State College, Greeley			
Advanced Driver Education	4	3 B	10
Automotive Systems	5	3 B	10
Driver Education I & II	3, 4, 5	3 B	10
Legal Aspects	4	3 B	10
Methods & Mat. of Driver Education	3	3 B	10
Multi-Media	4	3 B	10
MVOR	3	3 B	10
Organ. & Admin.	5	5 B	10
Safety Education	5	3 [illegible]	10
Safety Education	3, 4, 5	[illegible] B	10
Simulation	3	3 B	10
Colorado State University, Fort Collins			
Driver Education & Traffic Safety	3, 5, 6	3 B	10
Industrial & Constructional Safety	3, 4, 5	3 B	10
Problems in Safety Education	6	3 B	10
Safety & Driver Education (Adv.)	4, 5, 6	3 B	10
Safety Education	3, 4, 5, 6	3 B	10
Simulation & Program Organ.	6	3 B	10
Special Prob. in Driver Education	*	3 G	10
Southern Colorado State College, Pueblo			
Basic Driver & Safety Education	3, 4, 5	3 U	10
Introduction to Safety Education	3, 4, 5	3 U	10
University of Colorado, Boulder			
Advanced Driver Education	*	2 B	18
Driver Education	*	2 U	18
Safety Education	3	2 U	18
CONNECTICUT			
Central Connecticut State College, New Britian			
Driver Education	1, 2	3 B	16
Traffic Safety & Driver Education	2	3 B	16
Southern Connecticut State College, New Haven			
Advanced Methods & Materials in Teaching Driver & Safety Education	2	3 G	15
Driver Education & Training (non-licensed drivers only)	1, 2, 6	0 U	15
Driver Education & Traffic Safety I	1, 2, 6	3 U	15
Driver Education & Traffic Safety II	*6	3 G	3
Organ., Admin., & Supervision of Safety Education	*2	3 G	15
Principles of Accident Prevention	1	3 G	15
School & Campus Safety	6	3 G	3
Simulation in Driver Education	1	3 G	15
Traffic & Safety Education (Introduction)	1, 2, 6	3 U	15
Traffic Engineering & Highway Transportation	2	3 G	15
Traffic Law Enforcement	6	3 G	3
University of Bridgeport, Bridgeport			
Driver Edu. & Traf. Safety	1, 2, 6	3 U	15
DISTRICT OF COLUMBIA			
District of Columbia Teachers College			
Driver & Safety Education	*6	2 B	2
George Washington University			
Basic Simulation-Driver Education	2	3 G	13
Driver & Safety Education I	1, 6	3 G	13-6
Driver & Safety Education II	2, 6	3 G	13-6
Safety Education	2	3 U	13
Safety Education—Core & Prevention	2, 6	3 G	13-6
FLORIDA			
Florida A & M University, Tallahassee			
Driver & Traffic Education	3, 4, 5, 6	5q U	40
General Safety Education	3, 4, 5, 6	4q U	40
The Teaching of Driver & Traffic Safety Education	3, 4, 5, 6	5q U	40
Florida Atlantic University, Boca Raton			
Driver & Traffic Safety Education I	5	5q G	12
Driver & Traffic Safety Education II	6	5q G	8
Safety Education	4	5q G	12
Florida State University, Tallahassee			
Driver & Traffic Safety Education	3, 4, 5	5q U	12
Fundamentals of Safety Education	3, 5	4q B	12
Human Factors & the Highway Traffic Problem	5	4q G	12
Teaching of Driver & Traffic Safety Education	3, 4, 5	5q B	12
University of Florida, Gainesville			
Driver & Traffic Safety Education	3, 5, 6	5 U	10
School & Community Saf. Educ.	3, 4, 5, 6	3 U	10
Teaching Driver & Traffic Saf. Education	4, 6	5 U	10

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	When Offered	Credit Hours & Level	Weeks
University of Miami, Coral Gables			
Driver Education I	*1	3 B	18
Driver Education II	6	3 B	6
General Safety Education	*1, 2	3 B	18
General Safety Education	*6	3 B	6
GEORGIA			
Albany State College, Albany			
Driver & Traffic Safety Education	4, 6	5q U	10
General Safety Education & First Aid	3, 6	5q U	10
Teaching of Driver Traffic Safety Education	5, 6	5q U	10
Georgia Southern College, Statesboro			
Driver & Traffic Safety Education Methods	4, 6	5q B	12
General Safety Education & First Aid	3, 4, 5, 6	5q B	12
Introduction to Driver & Traffic Safety Education	3, 5, 6	5q B	12
Savannah State College, Savannah			
Advanced Driver & Traffic Safety Education	5, 6	5q U	12-6
First Aid & Safety	3, 4, 5, 6	5q U	12-6
Introduction to Driver Education	3, 4, 5, 6	5q U	12-6
University of Georgia, Athens			
Admin. of School Transportation & Safety Education	3, 6	5q G	12
Alcohol	6	5q B	12
Applied Project in Safety Education	6	5q G	12
Behavioral Factors in Traffic Education	4, 6	5q G	12
Driving Range & Simulation in Traffic Education	4, 6	5q G	12
Fundamentals of Safety Education	6	5q G	12
Multiple-Car-Off-Street-Driving Ranges & Simulation in Traffic Safety Education	6	5q G	12
Practices in Driver Education	6	5q G	12
Practices in Driver Education	3, 6	5q B	12
Principles of Traffic Safety	6	5q G	12
Principles of Traffic Safety	4, 5, 6	5q B	12
Safety Education	3, 6	5q B	12
Seminar for College Instructors of Safety Supervisors	6	5q G	12
HAWAII			
Department of Education, Honolulu			
Driver Education Instructor I	3	1 G	6
IDAHO			
Boise State College, Boise			
Advanced Driver Education	2, 6	2 U	18
Driver Education	1, 2, 6	2 U	18
Idaho State University, Pocatello			
Driver & Traffic Safety Education I	1, 6	2 B	18-9
Driver & Traffic Safety Education II	1, 6	2 B	18-9
Problems in Driver & Traffic Safety Education	2, 6	3 B	18-9
Problems & Practices of Safety Education	1, 6	3 B	18-9
Methods & Materials in Teaching Driver & Safety Education	2, 6	2 B	18-9
University of Idaho, Moscow			
Advanced Driver Education	**1, 2	2 U	18
Basic Driver Education	**1, 2	2 U	18
ILLINOIS			
Chicago State College, Chicago			
Advanced Safety Education	4, 5	3 G	16
Advanced Traffic Safety	4	2 U	16
Basic Safety Education	3	3 U	16
Driver Education	4	3 U	16
Eastern Illinois University, Charleston			
Advanced Driver Education & Traffic Safety	3, 5, 6	4q U	12
First Aid & Safety Education	4, 6	4q U	12
Industrial Accident Prevention	4, 6	4q U	12
Introduction to Driver Education	3, 5, 6	4q U	12
Instructor's First Aid	5, 6	4q U	12
Principles of Accident Prevention	3, 4, 5, 6	4q U	12
Illinois State University, Normal			
Accident Records, Investigation, and Evaluation	*1, 2, 6	3 B	18-8
Advanced Traffic Education	1, 2, 6	3 U	18-8
Agricultural Accident Prevention	6	3 B	8
Alcohol & Accident Phenomenon	*1, 2, 6	3 B	18-8
Automotive Fundamentals Driver Education Minors	6	2 U	8
Conceptual Models of Accident Prevention	*1, 2, 6	4 G	18-8
Disaster Preparation	*1, 2, 6	3 B	18-8
Externship ind. Tech. Accident Prevention	*1, 2, 6	3-8 G	18-8
Independent Study	1, 2, 6	1-4 G	18-8
Industrial Accident Prevention	*1, 6	3 B	18-8
Methods & Materials of Teaching Traffic Education	*1, 2, 6	3 B	18-8
Principles of Accident Prevention	1, 2, 6	3 U	18-8
Problems & Research in Accident Prevention	*2, 6	3 B	18-8
Seminar in College Teaching	*1, 2, 6	3 G	18-8
Seminar in Industrial Techniques Accident Prevention	1, 2, 6	2 G	18-8
Special Problems in Industrial Techniques Accident Prevention	*1, 2, 6	1-6 G	18-8
Thesis	1, 2, 6	2-6 G	18-8
Traffic Education I	1, 2, 6	3 U	18-8
Traffic Enforcement	1, 2, 6	2 B	18-8
Traffic Engineering	1, 2, 6	2 B	18-8
Traffic Flow Analysis	*1, 6	3 B	18-8
Millikin University, Decatur			
Driver Education & Advanced Driver Education	2, 6	3 U	16-4
Introd. to Safety Education	2, 6	4 U	16-4
Northeastern Illinois State College, Chicago			
Advanced Traffic Safety	3, 4, 6	2 B	16-8
Basic Driver Education	3, 4, 6	3 B	16-8
General Safety Education	3, 4, 6	3 B	16-8
Northern Illinois University, DeKalb			
Behavioral Factors in Safety	1	3 G	16
Driver Education Practices	1, 2, 6	3 U	16-8
Industrial Accident Prevention	1, 2	3 B	16
Mass Teaching Methods for Driver Education (Simil. Range)	1, 2, 6	3 B	16-8
Principles of Accident Prevention	1, 2	3 U	16
Program & Organ. of Driver Education	*1, 2, 6	2 G	16-8
Research in Safety	1, 2, 6	1-3 G	16-8
Safety Education Teaching Practices	1, 2	3 B	16
School Safety Programs	2	2 G	16-8
Seminar in Safety—Motorcycle Education for Teachers	6	3 G	8
Seminar in Safety—New Driv. Educ. Curriculum	*1, 2, 6	3 G	16-8
Traffic Safety Programs	1, 2	3 U	16
Workshop in Disaster Preparedness	*1, 2	2 B	16-8
Quincy College, Quincy			
Advanced Driver Education	1, 6	2 U	18-8
Driver Education	2, 6	3 U	18-8
Safety Education	2, 6	3 U	18-8
Southern Illinois University, Carbondale			
Driver & Traffic Safety Education I	3, 4, 5, 6	4 U	12
Driver & Traffic Safety Education Program Admin.	3, 4, 5, 6	4 B	12
Driver Simulation	4, 6	4 B	12
First Aid			
Introduction to Safety Education	3, 4, 5, 6	4 U	12
Methods & Materials in Safety Education	3, 5	4 U	12
Organ., Admin., & Supervision of Safety Education	4, 6	4 G	12
Practicum in Driver & Traffic Safety Education	3, 4, 5, 6	4 U	12
Problems & Research in Accident Prevention	3, 6	4 G	12
Safety Education Workshop	6	4 B	4
Thesis	3, 4, 5, 6	3-9 G	12
Traffic Law Enforcement & Planning	4, 6	4 B	12

34-C

	When Offered	Credit Hours & Level	Weeks
Workshop in Driver Education & Traffic Safety	6	4 B	12
Workshop in Health Education with Emphasis on Disaster Prep.	6	4 B	4
Workshop in Safety Education	4, 6	4 B	12
Southern Illinois University, Edwardsville			
Basic Driver Education	5	4 U	12
Methods & Materials of Driver Education	5	4 U	12
University of Illinois, Urbana			
Advanced Traffic Safety Education	1, 2, 6	3 U	16
Driver Education	1, 2, 6	3 U	16
Problems in Safety Education	2, 6	4 G	16
Safety Education	1, 2, 6	3 U	16
Safety Education Field Work	*	–U	8
Special Projects	1, 2, 6	4 G	16
Western Illinois University, Macomb			
Disaster & Civil Defense	3, 5	4—	—
Driver & Traffic Safety	3, 4, 5	6—	—
General Safety	3, 4, 5	6—	—
Industrial Safety	4, 5	2—	—
Methods in Driver Education	3, 4, 5	4—	—
Simulation & Range	3, 4, 5	4—	—

INDIANA

	When Offered	Credit Hours & Level	Weeks
Ball State University, Muncie			
Driver & Traffic Safety Education	3, 4, 5	5q U	10–12
Gen. Safety & First Aid	3, 4, 5	4q U	10–12
Butler University, Indianapolis			
Basic Driver Education	2, 6	3 B	16
First Aid & Safety	1, 2, 6	2 U	16
Safety Education	1, 6	3 B	16
Indiana Central College, Indianapolis			
Basic Driver Education	1, 2, 6	3 U	18–9
General Safety	2	3 U	18
Health & Safety Education	2	2 U	18
Indiana State University, Terre Haute			
Driver Education	1, 2, 6	3 U	18–5
Driver Education	1, 2, 6	3 G	18–5
Gen. Safety Education	**1, 2, 6	3 U	18–5
Safety Education	1, 2, 6	3 G	18–5
Traffic Safety	1, 6	3 U	18–5
Traffic Safety & Highway Engineering	2, 6	3 G	18–5
Indiana University, Bloomington			
Content & Materials in Saf. Ed.	1, 2	2 U	16
Driver Education	1, 2	2 U	16
Industrial Safety Education	2	3 U	16
Organ. & Admin. of Traffic Safety Education	1, 6	3 G	16–8
Organ. of Safety Education	1, 2, 6	2 G	16–8
Problems in Driver Education & Highway Safety	2, 6	3 G	16–8
Public Health Accident Control	2	3 G	16
Seminar in Safety Education	6	3 G	8
Traffic Safety Education for Business Majors	2	4 U	16
Traffic Safety Education for Teachers	1, 2	4 U	16
Manchester College, N. Manchester			
Driver & Traffic Safety Ed.	—	3.5 U	14
First Aid	—	1.75 U	7
Safety	—	1.75 U	7
Purdue University, Lafayette			
Driver Education	1, 2, 6	3 B	15–8
First Aid & Safety	1, 2, 6	2 U	15–8
Survey of Safety Education	1, 2, 6	3 B	15–8
Taylor University, Upland			
School Health, Saf., & First Aid	1, 2, 6	3 U	16–5
School Health Ed., & Safety	1	4 U	16
Techniques of Driver Ed.	1, 6	3 U	16–5
University of Evansville, Evansville			
Health & Safety Education for the Elementary School	3, 4, 5	4 U	12
Health & Safety Education for the Secondary School	5	4 U	12
Problems of Driver Training	5	3 U	12

IOWA

	When Offered	Credit Hours & Level	Weeks
Iowa State University, Ames			
Admin. of Accident Prevention Programs	6	3q G	6
Advanced Driver Education (Workshop)	*6	3q G	3
Advanced Teaching Techniques in Driver Education	6	3q G	3
Equipment in the Home	3, 4, 5	3q U	12
Highway Transportation	4, 6	3q B	12
Instructional Media I: Sources, Selection, Design	3, 6	3q G	12
Introduction to the Automobile	3, 4, 5	3q U	12
Multiple-Car Range Techniques	3, 4, 5, 6	1-3q B	12
Planning of Transportation Facilities	4, 5	3q U	12
Practices of Driver Education	3, 4, 5, 6	3q U	12
Principles of Transportation	3, 4, 5	3q U	12
Problems in the Psychology of Safety	3, 4, 5, 6	1-3q U	12
Problems of Human Conservation	3	3q U	12
Research	3, 4, 5, 6	q G	12
Safety Engineering	3, 4, 5, 6	3q B	12
Seminar in Safety	5	1q B	12
Simulation Techniques	3, 4, 5, 6	1-3q B	12
Shop Safety	3, 4, 5	3q U	12
Techniques of Teaching within Instructional Media	4	3q G	12
Techniques of Teaching with Media Systems	5	3q G	12
Theory & Principles of Driver Education	4	5q U	12
Topics in Safety	3, 4, 5, 6	1-3q G	12
Traffic Management	4, 5	4q B	12
Traffic Engineering	4	4q B	12
(Also additional courses in education, psychology, and economics for safety minors in other departments or schools of the university.)			
University of Dubuque, Dubuque			
Audio-Visual Materials & Techniques	1, 2	2 U	18
Driver Education & Highway Safety	2	4 U	18
First Aid	1, 2	2 U	12
First Aid: Instructor's Course	1, 2	1 U	6
General School Safety, K-12	1, 2	4 U	18
Organ. & Admin. of Safety Programs	1	3 U	18
Student Teaching: Safety Education	1, 2, 6	3 U	18–8
University of Northern Iowa, Cedar Falls			
AV Education	1, 2	2 B	18
Directing the Safety Program	1, 2	3 B	18
Driver & Safety Education	1, 2, 6	3 B	18–10
Driver & Traffic Safety Education	1, 2, 6	3 B	18–10
First Aid to the Injured	1, 2	2 U	18
Guides to Automotive Fundamentals	1, 2	3 B	18
Principles of Safety Education	1, 2, 6	4 U	18–10
Psychology of Accident Prevention	1, 2	2 B	18
Traffic Law Enforcement & Environment	1, 2	3 B	18

KANSAS

	When Offered	Credit Hours & Level	Weeks
Fort Hayes Kansas State College, Hays			
Driver & Traffic Safety Education I	1, 2, 6	3 U	18
Driver & Traffic Safety Education II	1, 2, 6	3 U	18
General Safety	1, 2, 6	3 B	18
Problems in Education (Driver Education)	1, 2, 6	1 G	—
Readings in Education (Driver Education)	1, 2, 6	1 G	—
Simulators & Multi-Car Driving Ranges	6	3 G	9
Kansas State College of Pittsburg, Pittsburg			
Driver & Traffic Safety Education I	1, 2, 6	3 U	18
Driver & Traffic Safety Education II	1, 2, 6	3 U	18
Driving Simulation & Ranges	2, 6	3 B	18
General Safety	2, 6	3 U	18
Kansas State University, Manhattan			
Driver Education I	1, 2	3 U	18
Driver Education II	1, 2	3 U	18
Problems in Driver Education	1, 2	1 U	—

	When Offered	Credit Hours & Level	Weeks
Problems in Safety	1, 2	1 U	—
Safety Education	1, 2	3 U	18
Kansas State Teachers College, Emporia			
Driver Education I	1, 2, 6	3 B	18-5
Driver Education II	1, 2, 6	3 B	18-3
Driving Simulators	6	2 B	2-5
Research Problems in Driver Education	1, 2, 6	1-2 G	1-3
Safety Education	1, 2, 6	3 B	18-3
McPherson College, McPherson			
Driver Education	*6	—	—
First Aid	1, 2	2 U	16
Wichita State University, Wichita			
Advanced Driver Education	2, 6	3 U	18-4
Basic Driver Education	1, 6	3 U	18-4
First Aid	1, 2, 6	2 U	18-8
Special Problems in Safety	1, 2, 6	1-3 U	—

KENTUCKY

	When Offered	Credit Hours & Level	Weeks
Eastern Kentucky University, Richmond			
Admin. & Supervision of Driver Education	2, 6	3 B	18
Teacher Preparation in Driver Education	1, 2, 6	3 B	18
Morehead State University, Morehead			
Driver Education	1, 2	2 U	18
First Aid & Safety	1, 2	2 U	18
Murray State University, Murray			
Driver Education I	1, 2	3 U	18
Driver Education II	* —	3 B	9
Safety Education	* —	3 U	9
University of Kentucky, Lexington			
Admin. of Health & Safety	1, 6	3 B	16-8
Driver & Traffic Safety Education	**1, 2, 6	3 B	16-4
Introduction to Safety Education	2	2 U	16
Seminar in Health & Safety Education	2, 6	3 G	16-8
Workshop in Health & Safety	*2, 6	2 B	16
Western Kentucky University, Bowling Green			
Advanced Studies in Driver Education	1, 2, 6	3 B	18
Driver Education & Traffic Safety I	1, 2, 6	3 B	18
Driver Education & Traffic Safety II	1, 2, 6	3 B	18
General Safety	1, 2	3 U	18

LOUISIANA

	When Offered	Credit Hours & Level	Weeks
Louisiana State University, Baton Rouge			
Driver Education & Traffic Safety	1, 2, 6	3 B	18-9
General Safety	**1, 2, 6	2 B	18-9
Instructor's First Aid	1, 2, 6	2 B	18-9
Louisiana State University in New Orleans			
Driver Education & Traffic Education	6	3 B	9
Safety Education	6	2 U	9
Louisiana Polytechnic Institute, Ruston			
Driver & Traffic Safety Education	1, 2, 6	2 U	12
Safety Education	2, 6	2 U	12
Northeast Louisiana State College, Monroe			
Driver Education & Traffic Safety	6	3 U	6
Safety Education	6	3 B	6
McNeese State College, Lake Charles			
Driver Education & Traffic Safety	2, 6	3 U	18
General Safety Education	1, 2, 6	3 U	18
Southeastern Louisiana College, Hammond			
Health (Driver Education)	4, 5, 6	3 U	18
University of Southwestern Louisiana, Lafayette			
Driver Education & Traffic Safety	1, 2, 6	3 U	18-9
General Safety & Accident Prevention	2	3 U	18
Methods & Materials for Traffic Safety	6	3 B	9

MAINE

	When Offered	Credit Hours & Level	Weeks
University of Maine, Augusta			
Advanced Driver & Traffic Safety	2	3 U	16
Basic Driver Education	2	3 U	16
Driver Education Simulation	2	3 U	16
University of Maine, Orono			
Advanced Driver Traffic Safety	6	3 U	3
Basic Driver Education	6	3 U	3
Driver Education Simulation	6	3 U	3

MARYLAND

	When Offered	Credit Hours & Level	Weeks
Frostburg State College, Frostburg			
Driver & Traffic Safety Education	2	3 G	16
Safety Education	2	3 G	16
Salisbury State College, Salisbury			
Current Problems in Traffic Safety	1, 2	3 B	16
Driver & Traffic Safety Education I & II	1, 2	3 B	16
General Safety Education	1, 2	3 B	16
Public School Transportation of School Children	1, 2	3 B	16
Pupil Transportation	1, 2	3 B	16
Towson State College, Towson			
Admin. & Supervision of Driver Education	6	3 B	16
Admin. & Supervision of Safety	5	3 B	16
Curriculum Development in Driver Education	6	6 B	32
Differentiated Teaching in Driver Education	1, 2, 6	3 B	16
Differentiated Teaching in Driver Simulation	1, 2, 6	3 B	16
Driver & Traffic Safety	1, 2, 6	3 B	16
Driver Characteristics & Improvement	6	3 B	16
General Safety Education	1, 2, 6	3 B	16
Methods & Material in Driver Education	1, 2, 6	3 B	16
Multi-Media for Driver Education	6	2 B	10
Programmed Instruction in Driver Education	6	2 B	10
Pupil Transportation	6	3 B	16
Pupil Transportation of School Children	6	3 B	16
University of Maryland, College Park			
Advanced First Aid	1, 2	2 U	16
Advanced Seminar	**6	3 B	16
Driver Education I	**1, 2	3 U	16
Driver Education II	**1, 2, 6	3 U	16
Essentials of Fire Protection	4	3 U	16
Field Lab. Projects Workshop	**6	3 B	16
Fire Protection Organization	5	3 U	16
First Aid & Safety	1, 2	1 U	16
Organ., Admin., & Supervision of School Safety Education	**1, 2, 6	3 U	16
Problems in Driver & Traffic Safety Education	**1, 2, 6	3 U	16
Safety Education	1, 2	3 U	16
The Driver, His Characteristics and Improvement	1, 2	3 U	16

MASSACHUSETTS

	When Offered	Credit Hours & Level	Weeks
Boston State College, Boston			
Driver Education	1, 2	3 B	15
Bridgewater State College, Bridgewater			
Driver Education	1, 2	3 B	—
Springfield College, Springfield			
Basic Course in Driver Education	1, 2	3 B	—
Westfield State College, Westfield			
Driver Education	1, 2	3 B	—
Worcester State College, Worcester			
Driver Education	1, 2	3 B	—

MICHIGAN

	When Offered	Credit Hours & Level	Weeks
Central Michigan University, Mount Pleasant			
Driver Education I	1, 2, 6	3 B	16
Driver Education II	1, 2	3 B	16
Driver Education III	2	3 B	16
Eastern Michigan University, Ypsilanti			
Advanced Driver Education	1, 2, 6	2 B	16-6
Driver Education	1, 2, 6	2 U	16-6
Seminar in Driver Education	1, 2, 6	2 B	16-6
Michigan State University, East Lansing			
Driver & Traffic Safety I	3, 5, 6	3q B	10
Driver & Traffic Safety II	3, 4, 5, 6	3q B	10
First Aid	3, 4, 5, 6	3q U	10
Highway Traffic Adm. I	3	3q U	10
Highway Traffic Adm. II	4	3q U	10
Highway Traffic Adm. III	5	3q U	10
Motor Vehicle Adm.	5, 6	3q G	10
Organ. & Admin. of Safety Education	5, 6	3q G	10
Psychological Factors in Traffic Safety	3, 4, 5, 6	3q G	10
Safety Education	3, 4, 6	3q B	10
Seminar in Alcohol Education	4, 6	3q G	10
Seminar in Driver Education Innovations	3, 4, 5, 6	3q G	10
Seminar in Principles of Traffic Comm.	3, 6	3q G	10
Seminar in Highway Traffic Administration	3, 4, 6	3q G	10
Traffic Engineering	3, 6	3q G	10
Northern Michigan University, Marquette			
Advanced Driver Education & Traffic Safety	1, 2, 6	4 B	16
Alcohol Education for Classroom & Community	*1	4 B	16
Driver Education & Traffic Safety	1, 2, 6	4 B	16
General Safety Education	2	4 U	16
Wayne State University, Detroit			
Methods & Materials of Instruction—Safety Education	6	3q B	11
Problems in Driver Education & Traffic Safety	3, 5	4q B	11
Seminar in Driver Education & Traffic Safety	3, 5	4q B	11
Teaching Driver Education & Traffic Safety	4, 6	4q B	11
Western Michigan University, Kalamazoo			
Driver Education I	1, 2, 6	B	16
Driver Education II	1, 6	B	16
Driver Education III	2, 6	B	16

MINNESOTA

	When Offered	Credit Hours & Level	Weeks
Bemidji State College, Bemidji			
Driver Education I	1, 6	4q U	5
Driver Education II	2, 6	3q U	5
Safety Education	2, 6	3q U	5
Traffic Engineering	1, 6	3q U	5
Concordia College, Moorhead			
Driver Education I	6	2 U	6
Driver Education II	6	2 U	6
First Aid	2	1 U	18
Safety Education	1, 6	2 U	18-6
Mankato State College, Mankato			
Driver & Traffic Safety Education I	3, 4, 5, 6	4q U	10-5
Driver & Traffic Safety Education II	3, 4, 5, 6	4q U	10-5
The Driving Simulator	3, 4, 6	3q B	10-5
First Aid	3, 4, 5, 6	3q U	10-5
Healthful Living	3, 4, 5, 6	3q U	10-5
Motorcycle Safety Workshop	*6	3q B	1
The Multiple Car Driving Range	3, 5, 6	3q B	10-5
Safety Education	3, 4, 5, 6	4q B	10-5
School Transportation Workshop	*6	3q B	1
Simulator & Range Practicum	3, 4, 5, 6	3q B	10-5
St. Cloud State College, St. Cloud			
Driver & Traffic Education I	3, 6	4q U	10-5
Driver & Traffic Education II	4, 6	4q U	10-5
Principles of Safety Education	3, 4, 5	4q U	10
University of Minnesota, Duluth			
Driver Education I	4, 6	4q B	10
Driver Education II	5, 6	4q B	10
Safety Education	3, 4, 6	4q U	10
Winona State College, Winona			
Driver Education I	3, 5	3q U	12
Driver Education II	5	3q U	12
Industrial Safety	*4	3q B	12
Principles of Safety Education	4, 5	3q U	12
Safety Problems in Behavior Modification	*3	3q G	12

MISSISSIPPI

	When Offered	Credit Hours & Level	Weeks
Delta State College, Cleveland			
Driver Education	1, 2, 6	3 U	18
Life Saving & Water Safety	1, 2, 6	1 U	18
Safety & First Aid	1, 2, 6	3 U	18
Traffic Safety	1, 2, 6	3 U	18
Mississippi College, Clinton			
Introduction of Driver Education	1	3 U	18
Methods & Materials in Driver Education	2	3 U	18
Mississippi State University, Starkville			
Basic Driver & Traffic Safety Education I	1, 2	3 U	12
Driver & Traffic Education Methods II	1, 2	3 B	12
First Aid and Safety	1, 2	3 U	12
Mississippi Valley State College, Itta Bena			
Basic Driver Education	6	3 U	5
Beginning Driver Education	6	0	5
Methods & Materials in Teaching Driver Education	6	3 U	5
Organization of Safety Education	6	3 U	5
University of Mississippi, University			
Introduction to Driver Education & Highway Safety	1, 2, 6	3 B	6
Methods of Driver & Highway Safety	1, 2, 6	3 B	6
University of Southern Mississippi, Hattiesburg			
Education for Traffic Safety	3, 4, 5, 6	4q B	12
Introduction to Driver Education	3, 4, 5, 6	4q B	12
Methods in Driver Education	3, 4, 5, 6	4q B	12
Simulation in Driver Education	3, 4, 5, 6	2q B	12

MISSOURI

	When Offered	Credit Hours & Level	Weeks
Central Missouri State College, Warrensburg			
Auto. Fuel & Elec. Systems	3, 4, 5, 6	2 U	11
Auto. Hyd. Systems & Power Trains	3, 4, 5, 6	3 U	11
Automotive Systems	3, 4, 5, 6	3 B	11
Audio-Visual Education	3, 4, 5, 6	3 U	11
Computer As a Research Tool	3	1 U	11
Criminal Evidence	4, 5, 6	3 U	11
Curr. Lit. & Research Tech.	3, 5, 6	3 G	11
Curr. Problems in Traffic Safety	6	2 G	11
Driver & Traffic Safety I & II	3, 4, 5, 6	3 U	11
Driver Improvement Programs & Techniques	3, 4, 6	2 G	11
Driver Simul.-Multi-Car Ranges	3, 4, 5, 6	3 B	11
Field Exper. in Safety Programs	5, 6	3 G	11
First Aid	3, 4, 5, 6	2 U	11
Industrial Psychology	3, 4, 5, 6	3 B	11
Indivi. Research Prob. Safety	3, 4, 5, 6	2-4 G	11
Industrial Sociology	3, 4, 5, 6	3 B	11
Introd. to Law Enforcement	3, 4, 5, 6	3 U	11
Introd. to Safety Education	3, 4, 5, 6	3 U	11
Internship in Safety	3, 4, 5, 6	1-6 G	11
Legal Aspects	4, 6	3 B	11
Mental Hygiene	3, 4, 5, 6	2 U	11
Methods of Teaching Driver & Safety Education	3, 4, 5, 6	2-4 U	11
Motor Vehicle Law	4, 6	3 B	11
Organ., Admin. & Supv. of Safety Programs	4, 6	3 G	11
Philosophy of Safety Education	4, 6	3 G	11
Police Organ. & Management	4	3 U	11
Power Technology	3, 4, 5, 6	3 U	11

31-F

	When Offered	Credit Hours & Level	Weeks
Police Laboratory	3	3 U	11
Prin. of Accident Prevention	3, 4, 5, 6	3 B	11
Psy. in Safety Education & Accident Prevention	3, 5, 6	2 B	11
Public Opinion & Communication	3, 4, 5, 6	3 B	11
Readings in Safety	3, 4, 5, 6	1-3 G	11
Selective Investigations in Safety Education	3, 4, 5, 6	3-6 G	11
Techniques of Research	3, 4, 5, 6	2 B	11
Stimulants & Depressants	3, 6	2 B	11
Supervision of School Transportation	3, 6	2 G	11
Seminar in Safety	6	2 G	11
Thesis (Safety)	3, 4, 5, 6	3-6 G	11
Traffic Admin. & Con.	3, 4, 5	3 U	11
Traffic Engineering I	6	2 G	11
Traffic Engineering II	4, 6	2 G	11
Workshop in Driver & Safety Education Innovations	6	2 G	3

(Also additional courses in education, law, sociology and industrial arts and technology are available in other departments for safety majors and minors.)

	When Offered	Credit Hours & Level	Weeks
Crowder College, Neosho			
Driver Training	3	0	12
Meramec Community College, Kirkwood			
Lifesaving	1, 2	1 U	16
Missouri Southern College, Joplin			
Advanced Driver & Traffic Safety	1, 2, 6	3 U	18-8
Automotive Systems	1, 2, 6	3 U	18-8
First Aid	1, 2	3 U	18-8
Introd. to Driver Education	1, 2, 6	3 U	18-8
Safety Education	1, 2, 6	3 U	18-8
Northeast Missouri State College, Kirksville			
Disaster & Emergency Procedures	1	2 U	18
Driver Education Seminar	6	3 U	1
Driver Improvement Programs & Techniques	1, 6	2 U	18-8
Driver & Safety Education I & II	1, 2, 6	3 U	18-8
Indiv. Problems & Research in Safety	1, 2, 6	1-4 U	18-8
Introd. to Safety Education	2, 6	3 U	18-8
Legal Aspects of Safety Education	2, 6	2 U	18-8
Mass Teaching Methods for Driver Education	1, 6	3 U	18-8
Northwest Missouri State College, Maryville			
Audio-Visual Aids	1, 2, 6	2 U	18-8
Driver & Traffic Safety Education I	1, 2	2 U	18
Driver & Traffic Safety Education I	6	2 U	3
Driver & Traffic Safety Education II	1, 2, 6	2 B	18-8
First Aid	1, 2, 6	2 U	18-8
Power & Fluid Mechanics	1, 2, 6	3 U	18-8
Safety Education	1, 2, 6	2 U	18-8
Seminar in Simulation	*6	2 B	2
Southwest Missouri State College, Springfield			
Driver Education	1, 2, 6	4 U	18-8
First Aid	1, 2, 6	2 U	18-8
Introd. to Safety Education	1, 2, 6	3 U	18-8
Problems in Driver Education & Traffic Safety	1, 2, 6	3 U	18-8
University of Missouri, Columbia			
Mass Programs & Safety Engineering	2	3 U	16
Principles of Explosives Engineering	1, 3	3 U	16

MONTANA

	When Offered	Credit Hours & Level	Weeks
Montana State University, Bozeman			
Advanced Driver & Traffic Safety	6	3q	3
Basic Driver & Traffic Safety	6	3q	3
Seminar in Safety Education	6	3q	3
Northern Montana College, Havre			
Current Trends in Driver Education	6	1-3q	3
Driver & Traffic Safety Education I	3, 6	3q B	12-3
Driver & Traffic Safety Education II	4, 6	3q B	12-3
Safety Education	3	3q B	12
University of Montana, Missoula			
Advanced Safety Education & Driver Training	6	3q B	3
Seminar: General Safety & Accident Prevention	6	3q B	3
Western Montana College, Dillon			
Advanced Safety Education & Driver Training	6	3q B	3
Basic Safety Education & Driver Training	6	3q B	3

NEBRASKA

	When Offered	Credit Hours & Level	Weeks
Chadron State College, Chadron			
Advanced Driver Education	*6	3 G	6
Driver Education & Traffic Safety I	1, 2	3 U	18
Driver Education & Traffic Safety II	1, 2, 6	3 U	18-6
First Aid	1, 2, 6	2 U	18-6
Safety Education	1, 6	3 U	18-6
Kearney State College, Kearney			
Driver Education I	1, 2, 6	3 U	18-6
Driver Education II	2	3 U	18
First Aid	1, 2, 6	2 U	18-6
First Aid Instructor	1, 2, 6	3 U	18-6
General Safety	1, 2, 6	2 U	18-6
Peru State College, Peru			
Beginning & Intermediate Swimming	1, 2, 6	1 U	18-5
Driver Education I	1, 6	3 U	18-5
Driver Education II	2, 6	3 U	18-5
First Aid	1, 2, 6	2 U	18-5
General Safety Education	1, 6	3 U	18-5
Survival Preparedness	1, 2	1 U	12 hrs.
University of Nebraska, Lincoln			
Driver Education I	1, 2, 6	3 U	18
Driver Education II	1, 2, 6	3 U	18
University of Nebraska, Omaha			
Driver & Traffic Safety Education I	6	3 B	3
Driver & Traffic Safety Education II	6	3 B	3
First Aid	1, 2, 6	3 U	18-3
General Safety Education	6	3 U	6
Wayne State College, Wayne			
Driver Education Practicum	1, 2, 6	1, 2 U	18
First Aid	1, 2, 6	2 U	18
General Safety Education	1, 2, 6	3 U	18
Organization & Administration of Safety Education	*	3 G	18
Traffic Safety Education I	1, 2, 3	3 U	18
Traffic Safety Education II	*2	3 U	18

NEVADA

	When Offered	Credit Hours & Level	Weeks
University of Nevada, Las Vegas			
Basic Driver Education	6	3 B	3
University of Nevada, Reno			
Basic Driver Education	6	3 B	3
Advanced Driver Education	6	3 B	3

NEW HAMPSHIRE

	When Offered	Credit Hours & Level	Weeks
Keene State College, Keene			
Driver & Traffic Safety Education	1, 2, 6	3 B	—
Teaching Driver Education	1, 2, 6	3 B	—

NEW JERSEY

	When Offered	Credit Hours & Level	Weeks
Glassboro State College, Glassboro			
Driver Education	2, 6	3 B	16-3
Montclair State College, Montclair			
Driver Education, Basic	1, 2, 6	3 G	18-3
Driver Education, Advanced Course	2	3 G	18
Newark State College, Newark			
Driver Education, Basic	*1, 2	3 G	18
Trenton State College, Trenton			
Driver Education Teacher Certification Program	3	3 U	3
Driver Education Teacher Certification Program	6	4 B	3
Safety Education	1	3 U	16
Safety Education in School Program	2	3 G	16

34-6

NEW MEXICO

	When Offered	Credit Hours & Level	Weeks
New Mexico Highlands University, Las Vegas			
Driver Education	6	3 B	2
Safety Education	6	3 B	2
New Mexico State University, Las Cruces			
First Aid & Safety	1, 2, 6	1 U	16–6
Safety Education	6	2 U	6
University of New Mexico, Albuquerque			
Basic Driver Education	6	3 B	3
General Safety Education	2, 6	3 B	18
Industrial Accident Prevention	—	3 B	18
Western New Mexico University, Silver City			
Facilities in Physical Education, Recreation and Safety	6	3 G	5
Organization, Administration of Safety Education	6	3 G	5

NEW YORK

	When Offered	Credit Hours & Level	Weeks
Brooklyn College of City University, New York			
Accident Research	*2	3 G	15
Driver & Traffic Safety Education	1, 2, 6	4 U	15
First Aid & Safety Education	1, 2, 6	3 U	15
Trends & Problems in Driver & Traffic Safety Education	2, 6	3 G	15
Ithaca College, Ithaca			
Driver & Traffic Safety Education	2	4 U	16
Driver & Traffic Safety Education	6	4 G	3
Safety Education	1	2 U	8
Trends & Problems in Driver & Traffic Safety Education	6	3 G	2
New York University (Center for Safety), New York			
Advanced Safety Management	5, 6	3 G	15–3
Comprehensive Programming in Traffic Safety	5	3 G	15
Driver & Traffic Safety Education	3, 5, 6	4 G	15–3
Dissertation Proposal Seminar	3, 5, 6	6 G	30–6
Environmental Hygiene	5	3 G	15
Field Experiences for the Safety Specialist	3, 5, 6	6 G	30
Foundations of Safety for the Modern Society	3, 5, 6	6 G	30
General Safety Education	3, 6	3 G	15
Independent Study: Safety	3, 5, 6	1-6 G	30–6
Industrial Safety Program: Organization, Administration, Supervision	3, 5, 6	6 G	30–3
Organization, Administration, Supervision Safety Education	3, 5, 6	6 G	30–6
Psychology of Safety Education & Accident Prevention	3, 6	3 G	15–3
Seminar: Current Problems in Traffic Safety	5, 6	3 G	15–3
Traffic Program Management	5	3 G	15
Trends & Problems in Driver & Traffic Safety Education	3, 5, 6	3 G	15–3
Workshop in Safety Education	3, 5	6 G	30
State University of New York, Albany			
Traffic Education I & II	1, 2, 6	3 U	15–7
Trends & Problems in Traffic Education	1, 6	3 G	15–2
(Also courses in biomechanics, engineering, and business for safety majors in other schools at New York University)			
State University College, Buffalo			
Advanced Driver Education & Traffic Safety	*6	3 G	6
Driver Education & Traffic Safety I & II	1, 2, 6	3 B	15–6
Driving School Instructor's Course	1	0	10
Effective Fleet Operation	*	0	8
Pupil Transportation for Supervisors	*2	0	8
Learning to Drive	1, 2, 6	0	15–6
Refresher & Updating Course for Driver Education Teachers	2	0	8
Trends & Problems in Driver Education & Traffic Safety	6	3 G	2
State University College, Cortland			
Advanced Driver & Traffic Safety Education	6	2 G	2
Driver & Traffic Safety Education I & II	6	2 B	2
State University College, Oswego			
Driver & Traffic Safety	1, 2	3 U	16
Driver & Traffic Safety Education	6	6 G	6
Problems & Trends in Driver Education	**2	3 G	15
Traffic Safety Movement	1, 2	3 U	16
Trends & Problems in Driver Education	6	4 G	6
Teachers College, Columbia University, New York			
Driver & Traffic Safety Education	6	4 G	6
Trends & Problems in Driver & Traffic Education	6	2 G	2

NORTH CAROLINA

	When Offered	Credit Hours & Level	Weeks
Atlantic Christian College, Wilson			
Teaching Driver Education	6	3 U	6
Catawba College, Salisbury			
Driver Education	6	—	—
East Carolina University, Greenville			
Driver Education	6	3 U	5½
Fayetteville State University, Fayetteville			
Driver & Safety Education	*6	3 G	2
Johnson C. Smith University, Charlotte			
Advanced Driver Education Seminar	4, 5	3 U	18
Workshop in Basic Driver Education	6	3 U	3
Lenoir Rhyne College, Hickory			
Methods of Teaching Traffic Safety & Driver Education	6	2 G	2
North Carolina Agr. & Tech. State University, Greensboro			
Driver Education & General Safety	1, 2, 6	3 B	—
Driver Education, Principles & Methods	*6	3 B	—
Driver Education & Teacher Training	1, 2	3 U	—
Driver Education & Traffic Safety	1, 2, 6	3 U	—
North Carolina State University, Raleigh			
Driver Education	5, 6	3 U	16–3
Pembroke State University, Pembroke			
Driver Training	*6	3 G	5
University of North Carolina, Chapel Hill			
Driver Education	**2	2 G	2

OHIO

	When Offered	Credit Hours & Level	Weeks
Ashland College, Ashland			
Driver Training Workshop	6	2 U	2
Bowling Green State University, Bowling Green			
Advanced Driver Education	6	3 U	2
Driver Education Instructors	3, 4, 5	3 U	10
Driver Education Instructors	6	3 U	5
Driver Education Instructors	6	3 U	2
Central State University, Wilberforce			
Driver Training for Teachers	3, 4, 5	3 B	10
Cleveland State University, Cleveland			
Driver & Traffic Safety Education (Advanced)	3, 4, 5, 6	3 G	10
Driver & Traffic Safety Education (Basic)	3, 4, 5, 6	3 U	10
Kent State University, Kent			
Introduction to Driver & Traffic Safety Education	3, 4, 5, 6	5q U	10–5
Organ. & Methods in Driver & Traffic Safety Education	*4, 5	3q B	10

31-B

	When Offered	Credit Hours & Level	Weeks
Miami University, Oxford			
Advanced Driver Education Institute	6	3q B	2
Advanced Driver Education & Safety	5, 6	3q B	12
Basic Driver Education Workshop	6	3q U	2
Driver Education & Safety	3, 4, 5	5q U	12
Ohio Northern University, Ada			
Driver Education	6	3q B	2
Ohio State University, Columbus			
Driver Education	3, 4, 5, 6	3q U	10
Ohio University, Athens			
Advanced Driver Teacher Training	6	3q U	2
University of Akron, Akron			
Driver Education for Teachers	4, 5, 6	4q B	10–6
University of Cincinnati, Cincinnati			
Driver Education	3	2q B	11
Driver Training	4	2q B	11
Driver Education Workshop	*5, 6	3-5q G	1–2
University of Dayton, Dayton			
Driver Education	1, 2, 6	3 U	16–6
OKLAHOMA			
Central State College, Edmond			
Driver & Traffic Safety Education I & II	1, 2, 6	3 B	18
Safety Education	1, 2, 6	3 B	18
Workshop in Safety Education	6	1 B	1
Northeastern State College, Tahlequah			
Advanced Driver Education	1, 2, 6	3 B	18
Auto Mechanics	*1, 2, 6	2 B	18
Beginner's Driver Education	1, 2, 6	2 U	18
Driver & Traffic Safety Education	1, 2, 6	3 B	18
First Aid	1, 2, 6	2 U	18
Safety Education	1, 2, 6	3 B	18
Southeastern State College, Durant			
Driver Education Workshop	6	1 B	1
Driver & Traffic Safety Education I	6	3 U	9
Driver & Traffic Safety Education II	6	3 B	9
General Safety Education	6	3 U	9
Oklahoma State University, Stillwater			
Audio-Visual Workshop in Driver Education	6	3 B	8
Automotive Technology for Driver Education Teachers	6	1 B	1
First Aid	*1, 2, 6	2 U	18
Methods of Driver & Traffic Safety I	1, 2, 6	3 B	3
Methods of Driver & Traffic Safety II	6	3 B	3
Methods & Materials in General Safety	1, 2, 6	3 B	3
Multiple-Car Driving Range	1, 6	2 B	2
School Shop Safety	*1, 2, 6	2 U	18
Simulation in Driving Education	6	2 B	2
Workshop in Driver & Safety Education	*6	1 G	1
Workshop in Safety Education	*6	1 G	1
OREGON			
Oregon State University, Corvallis			
Driver Education & Training	3, 4, 5, 6	3q B	11
Safety Education	3, 5	3q U	11
Special Problems in Traffic Safety	5, 6	3q G	11
Portland State University, Portland			
Driver Education & Training	6	3q B	2
University of Oregon, Eugene			
Admin. & Supervision of Driver Education Programs	6	3q G	11
Driver Education	5, 6	4q U	11
Problems in Traffic Safety	6	3q G	11
Psychology of Accident Prevention	4, 6	3q G	11
Psychophysical Testing in Driver Education	6	3q B	11
Research	*3, 4, 5, 6	3-6q G	11
Safety Education	3, 4, 5, 6	3q	11
Seminar	*3, 4, 5, 6	3q G	11
Special Problems in Driver Education	*3, 4, 5, 6	3q G	11
Workshop	*3, 4, 5, 6	2-3q G	11

	When Offered	Credit Hours & Level	Weeks
PENNSYLVANIA			
California State College, California			
Driver Education & Highway Safety	3, 5, 6	3 U	16–6
Introduction to Safety Education	*6	3 U	6
Materials & Methods in Safety Education in Sec. & Elem. Grades	*6	3 U	6
Visual & Other Aids in Safety	6	3 U	6
Clarion State College, Clarion			
Driver Education	1, 2	3	18
General Safety Education	2, 6	3	18–3
Organ. & Admin. in Safety Education	*1, 6	3	18–6
Psychology of Accident Prevention	*1	3	18
East Stroudsburg State College, East Stroudsburg			
Highway Safety & Driver Education	2, 6	3 U	18–6
Introduction to Safety Education	1, 6	3 U	18–6
Methods of Safety Education	1, 6	3 U	18–6
Principles of Safety Education	1, 6	2 U	18
Psychology of Accident Prevention	6	3 U	6
Edinboro State College, Edinboro			
Automotive System	*	3 B	—
Aviation	*	3 B	—
Current Lit. Seminar in Safety Education	1, 2, 6	3 G	—
Driving Simulator & Multiple Car	2, 6	3 B	—
Field Experiences in Safety Education	1, 2, 6	3 G	—
Highway Safety	1, 2, 6	3 B	—
Individual Research Problems in Safety Education	1, 2, 6	3 G	—
Introduction to Safety Education	1, 2, 6	3 B	—
Legal Aspects of Safety Education	1, 6	3 B	—
Motorcycle Safety	*	3 B	—
Motor Vehicle Law	*2	3 B	—
Organ., Admin., & Supervision of Safety Education	2, 6	3 B	—
Philosophy of Safety Education	1, 6	3 B	—
Practicum in Safety Education	1, 2, 6	3 G	—
Principles of Accident Prevention	1, 6	3 B	—
Programs in Safety Education	2, 6	3 G	—
Research Techniques in Safety Education	2	3 B	—
Stimulants and Depressants	*2	3 B	—
Thesis (Safety Education)	1, 2, 6	6 G	—
Traffic Engineering	—	3 B	—
Transportation Supervision	*	3 B	—
Geneva College, Beaver Falls			
Audio-Visual Methods in Safety Education	6	3 U	8
Driver Training Methods	6	3 U	8
General Safety Education	1, 6	3 U	16–8
Organ., & Admin. of Safety Education	2, 6	3 U	16–8
Indiana University of Pennsylvania; Indiana			
Driver Education	1, 2, 6	3 U	18
Introduction to Safety	1, 2, 6	3 U	18
Methods & Material in Safety Education	1, 2, 6	3 U	18
Organ., & Admin. of Safety Education	1, 2, 6	3 U	18
Psychology of Accident Prevention	1, 2, 6	3 U	18
Lock Haven State College, Lock Haven			
Driver Education	1, 2, 6	3 U	18
Materials and Methods (Driver Education)	*1	3 U	18
Organ., & Admin. of Safety	*6	3 U	6
Psychology of Accident Prevention	*2	3 U	18
Safety Education	1, 2	3 U	18
Millersville State College, Millersville			
Highway Safety & Driver Education	1, 2, 6	3 U	18–6
General Safety Education	1, 2, 6	3 U	18–6
Organ. & Admin. of Safety Education	1, 2, 6	3 U	18–6
Psychology of Accident Prevention	1, 2, 6	3 U	18–6

	When Offered	Credit Hours & Level	Weeks
Shippensburg State College, Shippensburg			
General Safety Education	6	3 U	3
Organ. & Admin. of Safety Education	6	3 U	3
Slippery Rock State College, Slippery Rock			
Highway Safety	1, 2, 6	3 U	18
Introd. to Safety	1, 2, 6	3 U	18
Organ. & Admin. of Safety Education	1, 2, 6	3 U	18
Psychology of Accident Prevention	1, 2, 6	3 U	18
Temple University, Philadelphia			
Curriculum in Safety Education	*5	3 G	15
Driver Education Workshop	6	3 G	3
Psychology of Safety & Accident Prevention	*5	3 G	15
University of Pittsburgh, Pittsburgh			
Driver Education	6	3 B	7½
Introduction to Safety Education	6	3 G	7½
Psychology of Safety	2	3 B	7½
Research Project Seminar	2	3 G	15
Research Reading in Safety	1	3 G	15
Pennsylvania State University, University Park			
Organ. & Supv. in Safety Education	**3, 4, 5, 6	3 G	10
Prin. & Methods of Teaching Safety Education	**3, 4, 5, 6	3 G	10
Teaching Traffic Safety & Auto Operation	**3, 4, 5, 6	3 G	10
Visual & Other Aids in Safety Education	**3, 4, 5, 6	3 G	10
West Chester State College, West Chester			
Education for Safe Living	1, 6	3 U	18–6
Preparation for Teaching Driver & Traffic Safety Education	1, 2, 6	3 U	18–6
Prin. & Prac. of Driver & Traffic Safety	2, 6	3 U	18–6
Methods & Material of Safety Education	2, 6	3 U	18–6
Contemproary Practices & Program Evaluation in Safety Education	1	3 G	18
History & Philosophy of Safety Education	2, 6	3 G	18
Problems in Traffic Safety & Driver Education	2, 6	3 G	18–6
Psychology in Safety Education and Accident Prevention	6	3 G	3

RHODE ISLAND

	When Offered	Credit Hours & Level	Weeks
Rhode Island College, Providence			
Basic Driver Education	6	3 B	6

SOUTH DAKOTA

	When Offered	Credit Hours & Level	Weeks
Black Hills State College, Spearfish			
Advanced Driver Education	6	3 G	3
Advanced Safety Education	6	3 G	3
First Aid & Safety Education	1, 2, 6	2 U	18–5
Methods of Driver Education	2, 6	2 U	18–5
Dakota State College, Madison			
Driver Education	*6	2 U	2
Huron College, Huron			
Driver Education Workshop	6	2 U	1
Northern State College, Aberdeen			
Driver & Traffic Safety Education	2	3 B	18
Safety Education	1, 2, 6	—	3
Simulation	6	—	3
Special Methods & Materials in Driver Education	2	3 B	18
Special Methods & Materials in Driver Education (Workshop) 2	2	2 B	2
South Dakota State University, Brookings			
Advanced Driver Education	6	2 U	18
Basic Driver Education	2	3 U	18
Driver Simulators	6	2 B	18
Safety Education	2	3 U	18
Southern State College, Springfield			
Driver Education	6	2 U	2
University of South Dakota, Vermillion			
Advanced Driver Education	2	2 B	18
Driver Education	1	2 B	18
Safety Education	1	3 B	18
Technique of Driving	2	1 B	18

TENNESSEE

	When Offered	Credit Hours & Level	Weeks
Austin Peay State University, Clarksville			
Driver Education	3, 4, 5	3 U	12
East Tennessee State University, Clarksville			
Advanced Driver Education	6	3q U	5
Beginning Driver Education	6	0	5
Driver Education	6	3q U	5
Highway Traffic & Safety	6	3q U	5
Tennessee State University, Nashville			
Driver Education & Traffic Safety	3, 4, 5, 6	3q U	12
Methods of Teaching Driver Education	3, 4, 5, 6	3q U	12
Tennessee Technological University, Cookeville			
Driver Education—Instructor's Training	3, 4, 5	3q B	12
University of Tennessee, Chattanooga			
Safety Education & First Aid	1, 2	2 U	18
University of Tennessee, Knoxville			
Advanced Driver & Traffic Safety Education	5, 6	3q G	10
Basic Driver & Traffic Safety Education	3, 4, 5, 6	3q B	10
Behavioral Problems in Accident Prevention	3	3q G	10
Civil & Defense Safety Education	4	3q G	10
Critical Issues in Safety Education	3, 4, 5, 6	3q G	10
First Aid & Disaster Education	3, 4, 5, 6	3q B	10
Industrial Safety	4, 5	3q B	10
Internship & Research in Safety Education	3, 4, 5, 6	3-9q G	10–30
Organ., Admin., & Supervision of Safety Programs	6	3q G	10
Principles of General Safety	3, 4, 5, 6	3q B	10
Problems & Research in Accident Prevention	5	3q G	10
School Shop Safety	4, 6	3q B	10
Teaching of Swimming & Life Savings	3, 4, 5, 6	3q B	10
Traffic Engineering	3, 4, 5	3q G	10
Transportation Law & Procedures	3, 4, 5, 6	3q B	10
Workshop in Safety Education	6	3-6q B	2–10

TEXAS

	When Offered	Credit Hours & Level	Weeks
East Texas State University, Commerce			
Driver Education	1, 2, 6	3 U	18–6
First Aid	1, 2, 6	3 U	18–6
Safety Education	1, 2, 6	3 U	18–6
Incarnate Word College, San Antonio			
Driver & Safety Education	2	6 U	18
Lamar State College of Technology, Beaumont			
Driver Education	1, 6	3 U	6–8
First Aid & Safety	1, 6	2 U	6–8
Student Teaching in Driver Education	2, 6	1 U	3
Midwestern University, Wichita Falls			
Driver Education & Traffic Safety	2, 6	—U	16–6
Pan American College, Edinburg			
Advanced Techniques for Teaching Driver Education	6	3 U	6
Driver Education	6	3 U	6
Safety Education	6	3 U	6

34-J

	When Offered	Credit Hours & Level	Weeks
Prairie View A & M College, Prairie View			
Driver & Safety Education	1, 2, 6	3 G	16–6
Driver Education	1, 2	2 B	16
Driver Education	1, 2, 6	3 B	16–6
Driver Safety	1, 2, 6	3 B	16–6
Safety Education	6	2 B	6
Traffic Safety Education	1, 2, 6	3 G	16–6
Sam Houston State University, Huntsville			
Driver & Traffic Safety Education I	1, 6	3 U	6
Driver & Traffic Safety Education II	2, 6	3 U	6
Southwest Texas State University, San Marcos			
Driver Education	1	3 U	6
Safety Education	2	3 U	6
Stephen F. Austin State University, Nacogdoches			
Driver Education	6	3 B	6
Safety Education	1, 2, 6	3 B	18–6
Sul Ross State University, Alpine			
Advanced Teaching Techniques of Driver & Traffic Saf. Edu.	*6	3 G	6
Basic Driver Education & Traffic Safety	1, 2, 6	3 B	16–6
Methods of Teaching Driver & Traffic Safety Education	1, 2, 6	3 B	16–6
Texas A & I University, Kingsville			
Traffic Safety Education I & II	6	3 B	6
Texas Wesleyan College, Fort Worth			
Driver Education	6	3 B	6
Safety Education	6	3 B	6
University of Houston, Houston			
Driver Education I	1, 2, 6	3 U	18–6
Driver Education II	1, 6	3 G	18–6
First Aid & Safety	1, 2, 6	3 U	18–6
Organ. & Admin. of Safety Education	*1, 6	3 G	18–6
Safety Seminar	*2, 6	3 G	18–6
West Texas State University, Canyon			
Driver & Traffic Safety Education I	1, 6	3 U	18–6
Driver & Traffic Safety Education II	2, 6	3 U	18–6
Safety Education	1, 2	3 U	18

VERMONT

	When Offered	Credit Hours & Level	Weeks
University of Vermont, Burlington			
Advanced Course in Driver Education for Teachers	6	3 B	3
Basic Course in Driver Education for Teachers	6	3 B	3

VIRGINIA

	When Offered	Credit Hours & Level	Weeks
Bridgewater College, Bridgewater			
Driver Education—Basic	2, 6	3 U	16
Safety Education	1, 6	3 U	16
College of William and Mary, Williamsburg			
Basic Driver Education	2, 6	3 U	16
Safety Education & First Aid	2	3 U	16
Emory and Henry College, Emory			
Driver Education	3, 6	3 U	16
Safety Education	4, 6	3 U	16
Hampton Institute, Hampton			
Driver Education I	1, 6	3 U	16
Driver Education II	2, 6	3 U	16
Longwood College, Farmville			
Driver Education	1	2 U	16
Driver Education	2	2 U	16
Safety & First Aid	2, 6	3 U	16
Lynchburg College, Lynchburg			
Driver Education	2, 6	3 U	18
Driver Education	2, 6	3 G	18
Safety Education	1, 6	3 U	18
Safety Education	1, 6	3 G	18
Madison College, Harrisonburg			
Driver & Traffic Safety	1, 2, 6	3 U	18–8
Safety & First Aid	1, 2, 6	3 U	18–8
Norfolk State College, Norfolk			
Advanced Driver Education	1, 2, 6	3 U	18–8
Driver Education	1, 2, 6	3 U	18–8
Safety Education	1, 2	3 U	18
Old Dominion University, Norfolk			
Driver Education	**1, 2, 6	3 U	15–3
First Aid	1, 2, 6	2 U	15
Safety Education	**1, 2, 6	3 U	15–3
Radford College, Radford			
Driver Education I & II	3, 4, 5, 6	2 U	11
General Safety	3, 4, 5, 6	2 U	11
Roanoke College, Salem			
Driver Education & Traffic Safety	2, 6	3 U	16
University of Richmond, Richmond			
First Aid & General Safety	2, 6	3 U	16–8
University of Virginia, Charlottesville			
Driver Education	**2, 6	3 B	18
General Safety	**2, 6	3 B	18
Virginia Commonwealth University, Richmond			
Driver Education	1, 2, 6	3 U	18
Safety Education	1, 2, 6	3 U	18
Virginia Polytechnic Institute, Blacksburg			
Driver Education	4, 5	3q U	10
General Safety & First Aid	3, 4	3q U	10
Methods & Materials in Safety	3	3q U	10
Virginia State College, Petersburg			
Driver Education	1, 2, 6	3 B	18–3
Driver Training & Traffic Safety	1, 2, 6	2 B	18–6
First Aid & Safety	1	2 U	18
Workshop in Driver Education	6	3 B	2

WASHINGTON

	When Offered	Credit Hours & Level	Weeks
Central Washington State College, Ellensburg			
Driver & Traffic Safety Education I	**3, 4, 6	3q B	9–10
Driver & Traffic Safety Education II	**5, 6	3q B	9–10
General Safety Education	**3, 5, 6	3q B	9–10
Highway Safety Traffic Control	**4, 6	3q B	9–10
Organ. & Supervision of Traffic Education	**4	3q B	9–10
Western Washington State College, Bellingham			
Advanced Driver & Traffic Safety Education	6	3q B	3
Basic Driver & Traffic Safety Education	6	3q B	3
Directed Research in Driver & Traffic Safety Education	6	3q B	6
Safety Education	3	3q B	9

WEST VIRGINIA

	When Offered	Credit Hours & Level	Weeks
Marshall University, Huntington			
Advanced Problems in Driver Education	1, 2, 6	3 B	—
Basic Driver & Traffic Safety Education	1, 2, 6	3 U	—
First Aid	1, 2, 6	2 U	—
General Safety Education	1, 2, 6	3 U	—
Industrial Safety	2	3 B	—
Traffic Law Enforcement	2, 6	3 B	—
Shepherd College, Shepherdstown			
Driver Education & Traffic Safety	2, 6	3 U	—
General Safety Education	1	3 U	—
Problems in Driver & Safety Education	6	3 U	—
West Virginia State College, Institute			
Basic Driver Education	1, 2, 6	2 U	—
Problems in Driver & Traffic Safety Education	1, 2, 6	3 U	—
Programs in Safety Education	1, 2, 6	3 U	—
Methods in Teaching Driver & Traffic Safety Education	1, 2, 6	3 U	—
Organ. & Admin. of Safety Education	2, 6	2 U	—

34-K

	When Offered	Credit Hours & Level	Weeks
West Virginia University, Morgantown			
A Practicum in Safety	1, 2, 6	3 G	—
Driver & Traffic Safety Education	2, 6	3 G	10
Environment Aspects of Hazards Control	2	3 G	—
First Aid	1, 2, 6	3 U	—
Human Factors in Accident Prevention	1, 6	3 G	—
Philosophical Concepts of Safety	1, 6	3 G	5
Planning & Coordinating Safety Programs	1	3 G	—
Principles of Safety Education	1, 2, 6	2 U	5
Research in Safety Education	1, 2, 6	1-15 G	5
Safety & Traffic Safety Education Problems	2	3 G	—
Safety Manpower Development	2	3 G	—
Safety Problems, Simulation, & Innovation	6	3 G	10
Safety & Traffic Safety Educational Content Areas	6	3 G	5
Safety Measureability, Evaluation, & Research	2, 6	3 G	—
School & College Safety Administration	1, 6	3 G	5
Tech. & Procedures in Driver & Safety Education	1, 2	3 U	—
West Liberty State College, West Liberty			
Care & Prevention of Athletic	1, 2, 6	1 U	—
Driver Education & Traffic Safety	1, 2, 6	3 U	—
Problems in Driver Education & Traffic Safety	2, 6	3 U	—
Principles of Safety Education	1, 2	3 U	—
Safety Education & First Aid	1, 2, 6	3 U	—
Swimming IV	1, 2, 6	1 U	—
Traffic Law Enforcement & Occupational Safety	1, 6	2 U	—

WISCONSIN

	When Offered	Credit Hours & Level	Weeks
St. Norbert College, West De Pere			
Advanced Traffic Safety	*6	3 U	6
Basic Problems in Driver Education	1	3 U	15
Safety	2	3 U	15
Stout State University, Menomonie			
Admin. of Driver Education	**1, 2, 6	3 B	18–8
Civil Defense Education	6	2 B	8
Driver Education	1, 2, 6	3 B	18–8
Driver Improvement Programs	**1, 2, 6	2 B	18–6
General Safety	**1, 2, 6	3 B	18–8
Independent Studies in Safety	1, 2, 6	2 B	18–8
Industrial Safety	1, 2	3 B	18
Traffic & Highway Safety	**1, 2	3 B	18
University of Wisconsin, Madison			
Independent Research (Safety)	1, 2, 6	3 G	18–8
Independent Study (Safety)	1, 2, 6	3 B	18–8
Instructional Innovations & Procedures in Driver & Traffic Safety Education	2, 6	3 B	18–8
Problems & Materials in Driver Education	6	3 B	8
Problems & Materials in Safety Education	1, 6	3 B	18–8
Pro-Seminar: Critical Education Issues Related to Injury & Loss Prevention & Control	1, 6	3 B	18–8
Pro-Seminar: Legal & Liability Factors in Injury & Loss Prevention & Control	6	3 B	8
Pro-Seminar: Organ., Admin., & Supervision Aspects of Safety Programs	6	3 B	8
Seminar: Curriculum Development in Safety & Traffic Education	6	3 G	3
Seminar: Safety Research Approaches & Procedures	1, 2, 6	3 G	18–8
University of Wisconsin, Milwaukee			
Advanced Seminar in Driver Education	1, 2, 6	3 B	18–8
Instruc. Innovations & Procedures in Driver Education	1, 2, 6	3 B	18–8
Problems & Materials in Driver Education (Practice Teaching Lab. Course)	1, 2, 6	3 B	18–8
Problems & Materials in Safety Education	1, 2, 6	3 B	18–8
Wisconsin State University, Oshkosh			
Advanced Driver Education	1, 2, 6	3 U	18–8
Driver Education	1, 2, 6	3 U	18–8
General Safety	1, 2, 6	3 U	18–8
Industrial & Institutional Saf.	1	3 U	18
Traffic Safety Education	1	2 U	18
Wisconsin State University, Platteville			
Advanced Driver Education	1, 2, 6	3 U	18–8
Admin. & Supervision of Safety Programs	2, 6	3 U	18–8
Basic Driver Education	1, 2, 6	3 U	18–8
Communications Systems & Regulations	*2	3 U	18
First-Aid & Accident Prevention	1, 6	2 U	18–8
Industrial Safety	1	3 U	18
Job Analysis in Indus. Society	1, 2	3 U	18
Research Methods in Safety Education	2	3 U	18
Safety Education	1, 2, 6	3 U	18–8
Safety in the Elementary School	1	3 U	18
School Bus Transportation Superv. Seminar	*6	1 U	1
Seminar in Civil Defense	***2	3 U	18
Seminar in Safety	2	2 U	18
Traffic Control	1, 2, 6	3 U	18–8
Workshop in Driver Education	*6	1 U	1
Wisconsin State University, River Falls			
Driver Education	3, 4, 5, 6	3q U	8
Safety Education	3, 4, 5, 6	3q U	8
Safety Education	3, 4, 5, 6	2q U	8
Wisconsin State University, Stevens Point			
Advanced Driver Education & Safety Education	6	3 U	4
Beginning Driver Education	6	3 U	4
Beginning Safety Education	6	3 U	8
Wisconsin State University, Whitewater			
Driver Education	1, 2, 6	3 U	18–8
Industrial Safety Management	1, 2, 6	3 B	18–8
Safety Education	1, 2, 6	3 U	18–8
School Safety Management	1, 2, 6	3 B	18–8
Traffic Safety Education	1, 2, 6	3 B	18–8

WYOMING

	When Offered	Credit Hours & Level	Weeks
University of Wyoming, Laramie			
Advanced Driver Education (Workshop)	6	3 B	2
Driver Education	6	3 B	8

C

Curriculum Development

Objectives of Driver Instruction

The driving instructor may be called upon to do more than teach people how to drive a car. Upon occasion he must set up programs that will meet state secondary school curriculum requirements, conditions for early (under 18) licensing, or the requirements of some special program. In these situations the instructor may be called upon to develop a formal curriculum. This will involve (1) establishing instructional objectives, (2) selecting and organizing instructional content, (3) selecting instructional methods and media, and (4) development of lesson plans.

> **The student should know the systematic procedures for determining the instructional objectives that will allow driving instruction to produce safe, efficient vehicle operators.**

The ultimate goal of any driving instruction is to enable drivers to operate their vehicles safely, efficiently, and responsibly. If this goal is to be attained, objectives for driving instruction must be derived from those behaviors that constitute "safe, efficient, responsible" driving.

Many driving instructors, like most drivers, tend to feel they know what behaviors make up the act of driving. Doubtless they know a great deal. However, a more systematic approach than depending upon one's own powers of recall is necessary if a truly comprehensive identification of driving behaviors is to take place. One highly systematic effort was the "Driver Education Task Analysis" performed by the Human Resources Research Organization (HumRRO) under sponsorship of NHTSA. Since this project served as the basis for much of the material used in identifying driving task requirements in Section III of this guide, a brief description is warranted. Moreover, the same general approach to the identification of instructional objectives may help individual driving instructors in establishing additional objectives appropriate to the particular requirements of their region.

The Driver Education Task Analysis was intended primarily as a source of technical data to guide qualified curriculum development specialists in preparing appropriate driver education programs. It was not intended for direct application by driving instructors. Another task analysis has been performed by Malfetti (1970). While not as detailed as the Driver Education Task Analysis, the Malfetti analysis is prepared in a way that makes it more directly usable to driving instructors.

ANALYSIS OF THE HIGHWAY TRANSPORTATION SYSTEM

In attempting to identify the behaviors a driver may be called upon to perform, it is useful to look first at the larger system in which driving takes place. This system, generally called the Highway Transportation System, consists of the driver, the vehicle he operates, the roadway over which he travels, the traffic he encounters, and the general physical environment in which the operation takes place. Each of these highway transportation system "components" is capable of creating requirements to which the driver must respond.

First, the driver must respond to himself as a component. His level of fatigue or alertness, his emotional state, his physical condition, and a variety of other individual factors may give rise to specific behaviors. For example, the tired driver may need to turn on the radio, open the window, get out of the car, or undertake other steps to offset fatigue.

Secondly, the characteristics of the vehicle determine much of what the driver must do. The nature of the vehicle's controls, displays, and handling characteristics largely determine what the driver must do to operate the vehicle, while the physical structures and mechanisms give rise to a variety of servicing and maintenance requirements.

Thirdly, the roadway exerts a strong and pervasive influence over what the driver does through its contours (hills and curves), configurations (intersections, on- and off-ramps), its surface conditions, and associated traffic control markings and devices.

The most complex and potentially hazardous set of requirements arises from the presence on the roadway of other traffic, including both vehicular and pedestrian traffic. It is the presence on the roadway of other road users that creates the need for constant visual surveillance as well as the behaviors involved in such activities as passing, following, and overtaking.

Finally the larger physical environment with its changes in illumination, temperature, and weather conditions, influences how the driver will operate his vehicle.

The starting point in the Driver Education Task Analysis was an examination of the highway transportation system to identify the full range of system characteristics capable of giving rise to driving behaviors. This analysis was augmented by a review of over 600 publications, ranging from research reports to textbooks, dealing with driving. In all, over 1,000 behavior-related system characteristics were identified. These characteristics were analyzed both individually and in combination with one another, to identify the specific behaviors that were required of drivers. The result of this analysis was a list of over 1700 specific behaviors that make up what we know of as driving. This list of behaviors defines a set of performance requirements which serve for the curriculum development process a function which is analogous to that served by performance specifications in the development of a manufacturing process.

ANALYSIS OF CRITICALITY

Even the most extensive program of driving instruction cannot possibly qualify beginning drivers to perform all required behaviors. Initial instruction must be somewhat selective. In determining which behaviors to deal with, and to what degree to cover them, the major considerations should be the criticality of the behavior to the safety and efficiency of the highway transportation system rather than, for example, the interests of a particular instructor or student. Unfortunately, there is very little valid data bearing upon the relationship between specific behaviors and the safety or efficiency of the highway transportation system. For this reason, criticality has to be determined through a process of human judgment. In the Driver Education Task Analysis the judgments were rendered by some 100 highway safety authorities representing the fields of driver education, driver licensing, traffic enforcement, fleet safety, and broad highway safety programs. The process by which criticality was evaluated was extremely complex and need not be considered here. The result was a criticality value for each driving behavior. While the values represent only opinion, the agreement among those rendering the judgments was sufficiently high to warrant treating the criticality values as representing a true "consensus." Whatever their limitations, it would appear that the criticality values offer a better basis for setting priorities in driving instruction than would be the opinion of any one individual instructor.

DETERMINATION OF INSTRUCTIONAL OBJECTIVES

The final step in the systematic determination of instructional objectives is the selection of those behaviors that are to become performance objectives for a particular instructional program, and the identification of the knowledges and skills that would enable students to attain these objectives, generally called "enabling" objectives.

In determining which of the behaviors required of drivers should become performance objectives, primary attention should be given to the criticality of the behavior to safe and effective driving. In the Driver Education Task Analysis, the highway safety authorities described earlier were asked to identify those behaviors that were sufficiently critical to warrant being required of a new driver before he might enter the highway transportation system. These judgments form the basis upon which performance objectives were selected. A driving school considering objectives for a course to be given to experienced drivers may wish to eliminate some of the more elementary objectives. No instructor should accept any set of objectives without close examination. The results of the Driver Education Task Analysis should be viewed merely as a source.

While criticality to safe and efficient driving should be a primary determinant [illegible] the selection of performance objectives, the individual instructor must temper considerations of criticality with the realities of his own school, including the needs and desires of his client and his ability to support attainment of various performance objectives within his school's resources. Many performances, such as those involved in collision avoidance, may be highly critical and yet not be capable of being taught within a particular school. The performance objectives identified in the Driver Education Task Analysis should, therefore, be viewed as constituting a goal toward which to strive but not necessarily one that is universally capable of attainment.

Once performance objectives have been established, the driving instructor must attempt to identify those skills and knowledges that are required in attainment of performance objectives. These skills and knowledges become objectives in themselves. Knowledge objectives may be divided into two categories: those that enable by showing the driver how to perform, and those that enable in the sense of motivating him to perform. The first category of knowledge objectives includes information related to the performances themselves, as for example the activities required in performing a left-hand turn. In addition, it includes factual information (e.g., speed limits, tire pressures) and concepts (e.g., centrifugal force, effects of alcohol) that aids him in carrying out the performances.

The second category, motivating knowledge objectives, is primarily concerned with information that plays a role in influencing the driver's attitudes, his beliefs and opinions, relating to various driving behaviors. Examples of such objectives include accident statistics or forces acting upon the occupant of a motor vehicle in a crash. It is believed that information related to these adverse consequences of poor driving will motivate drivers to adopt those behaviors that constitute performance objectives.

Both types of knowledge objectives should be derived from identified performance objectives. This is the only way to assure that the course provides all of the information that is required and avoids including information that is not required.

Many performance objectives require, in addition to the mere possession of information, the development of perceptual or motor skills. Perceptual skills relate to the ability to interpret patterns of stimuli while motor skills relate to the ability to carry out complex manipulative performances in a coordinated, smooth, or rapid manner. The distinguishing characteristic of skills is the need for practice in developing a capability to perform. In establishing skill objectives, the instructor will generally wish to describe the nature of the stimulus pattern (perceptual skills) or performances (motor skills) in somewhat more detail than would be the case for those performances that are primarily dependent upon the acquisition of information.

Advantages of preparing performance-oriented instructional objectives include the following:

1. They provide a means by which the instructor can plan an appropriate set of relevant student learning experiences, and the materials needed to support those experiences.
2. They provide a medium through which students and other interested parties can identify just what the course is to accomplish.
3. They provide a standard by which the student achievement may be evaluated, for the student as well as other substitute instructors.

Some instructors have been concerned that the formal preparation of instructional objectives may stifle the individual instructor's creativity and initiative. However, in practice such does not seem to occur. Rather, by having an established set of objectives to work from, the instructor generally experiences greater freedom in the preparation of course materials than is the case where objectives are vaguely stated and policy guidance must be applied directly to materials themselves. Moreover, objectives are not immutable; whenever better objectives can be identified, they may be adopted. What is important is that the objectives be made explicit so that they are shared by everyone.

BASIC REFERENCES

McKnight, A. James, "System Analysis Pinpoints Driver Task," *Traffic Safety*, Vol. 70, No. 12, pp. 16-17, 35-36, National Safety Council Publication, December 1970.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis, Volume I: Task Descriptions,* Human Resources Research Organization, Alexandria, Virginia, Final Report, November 1970.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis, Volume II: Task Analysis Methods.* pp. vii-viii, 3-11. Driver Education Task Analysis, Volume II: Task Analysis Methods. Human Resources Research Organization, Alexandria, Virginia, 1970.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers.* Teachers College, Columbia University, (Prepared for American Association of Motor Vehicles Administrators under a special grant by the Insurance Institute for Highway Safety) 1970.

Miller, Jerry L. *Writing Behavioral Objectives in Driver and Traffic Safety,* Traffic Safety Institute, Eastern Kentucky University (in press).

SUPPLEMENTARY REFERENCES

Ammerman, Harry L. and Melching, William H. *The Derivation, Analysis, and Classification of Instructional Objectives,* HumRRO Technical Report 66-4, May 1966.

Drumheller, Sidney J. *Handbook of Curriculum Design for Individualized Instruction: How to Develop Curriculum Materials from Rigorously Defined Behavioral Objectives,* Educational Technology Publications, Englewood Cliffs, New Jersey, 1971.

Mager, Robert F. *Preparing Objectives for Programmed Instruction,* Fearon, San Francisco, 1962.

Popham, James W., et. al. *Instructional Objectives: American Educational Research Association Monograph Series on Curriculum Evaluation,* Rand McNally & Company, Chicago, 1969.

Selection and Organization of Instructional Content

The student should be able to select and organize instructional content needed to implement established instructional objectives.

SELECTING CONTENT

Knowledge Information

Once the instructional objectives—performance, knowledge, and skill—have been identified for a program of instruction, content related to the knowledge and skill objectives must be selected and organized so that the instructional program contains relevant and meaningful material. Information related to the knowledge objectives is conveniently classified under the following categories:

> ***Procedural Information***—Information describing the specific performances that are required, e.g., starting procedures, left turn procedures, servicing and maintenance procedures.
>
> ***Factual Information***—Information concerned with various characteristics of the highway transportation system which either (1) enable drivers to carry out procedures, e.g., speed limits, location of displays, tire pressure, meaning of signs, or (2) influence the driver's attitudes toward application of procedures, e.g., accident statistics, particularly in relation to specific hazards such as railroad crossings and failure to wear safety belts.
>
> ***Conceptual Information***—Information concerning the relationships among characteristics of the highway transportation system, including those that (1) enable drivers to reach sound decisions, e.g., interpretation of road maps, freeway interchange configurations, and (2) influence the driver's attitudes in a way that will encourage correct decisions, e.g., vehicle closing speeds, effects of rain upon surface friction.

Knowledge information of this nature must be selected for each driving task—accelerating, stopping, passing, parking, etc. A variety of content sources should be reviewed and selected on the basis of their relationship to the knowledge objectives. Sources may include the following types:

1. ***Textbooks,*** particularly those with emphasis on performance orientation, e.g., Learning to Drive by William G. Anderson (Addison-Wesley Publishing Company, 1971).
2. ***Curriculum materials,*** including:

   Highway Users Federation for Safety and Mobility's (HUFSAM) "Resource Curriculum."

   Driver education curricula from state departments of education and educational institutions having programs in driver education and traffic safety (Michigan State University, Central Missouri State College, University of Maryland).

   National Highway Traffic Safety Administration (NHTSA)-sponsored curricula, including the U.S. Coast Guard program prepared by American University, and this Instructor Guide.

   Curricula prepared by the military services, particularly the multimedia program of the U.S. Air Force.
3. ***Technical references and manuals,*** particularly instructor manuals published by organizations such as AEtna Life and Casualty Company and Allstate Insurance Company on driving simulators and their use in driver instruction.
4. ***Periodicals and journals*** which contain articles relevant to various aspects of the driving tasks.

A number of these sources should be reviewed for material relevant to specified knowledge objectives. Only material having a clear relationship to specified objectives, however, should be selected for inclusion in the program of instruction. Material which is not behaviorally relevant should be excluded. For example, knowledge of the structure and function of the eye would appear to play little or no part in either enabling or motivating drivers to carry out visual or perceptual tasks and should not be selected for inclusion in a driver education program, even though such information now appears in a number of tests.

Skill Information

Skills involved in driving are largely of the following two types:

> ***Perceptual***—The ability to interpret stimulus patterns correctly, e.g., judgment of stopping distance, judgment of gap size.
>
> ***Psychomotor***—The ability to perform responses requiring particular speed, coordination, or smoothness, e.g., coordination of clutch and accelerator, smooth brake application.

The formation of skills requires the communication of appropriate information and the provision of practice until the activity may be performed at the required level. Instructional "content" consists primarily of a description of the nature of the skills.

Up until recently, the instructor had difficulty obtaining clear, concise skill descriptions and related information for skills associated with passing, parking, backing, etc. Sources from which skill information can now be selected include:

1. Driver Education Task Analysis, Volume I: Task Descriptions, Human Resources Research Organization (HumRRO), Alexandria, Virginia 22314.
2. Driver Education Task Analysis, Volume III: Instructional Objectives, HumRRO.
3. A Description of the Driving Task Adaptable for a Manual for Beginning Drivers, by James L. Malfetti, Columbia University, 1970.
4. In-Car Instruction: Methods and Content, by William G. Anderson, Addison-Wesley Publishing Company, Reading, Massachusetts, 1968.

These sources contain information on what is required of the beginning driver in terms of skills that would enable him to drive safely and effectively.

Attitudes and Habits

Development of driver attitudes is essentially a matter of communicating information that will lead to a set of beliefs that are consistent with effective driving. For example, development of favorable attitudes toward the use of safety belts would take place through the communication of information concerning accidents with and without safety belts, photographs or motion pictures of "dummy" occupants during test crashes, and so on.

Many existing driver education programs make liberal use of threats such as "speed kills," or scare tactics such as "gory" movies in an attempt to influence attitudes. While, in a technical sense, these techniques do involve the communication of "information," the approach is emotional rather than rational. In view of the abundance of research demonstrating the futility of emotional appeal, such an approach should be excluded from consideration by the instructor who is selecting material for a program of instruction.

The term "habit" generally refers to a characteristic response of a driver that occurs without the driver's having to think about it. Use of turn signals when changing lanes, response to traffic signals, and use of the rear vision mirror are examples of habitual responses. In order for a habit to be established, the situation to which the response is made must occur with relatively high frequency.

In developing instructional content, those responses that are required with sufficient regularity to warrant their being established as habits should be included.

One basic assumption often made by individuals charged with the responsibility of selecting content for programs of instruction is that the beginning driver has little or no previous knowledge or skill directly related to driving. All items selected as being directly related to the driving task are also initially selected for instruction. However in many areas, it is not unusual to find that some of the material found relevant to specific objectives has already been learned by the student and, consequently, is not needed in the instructional program. This fact is often not accommodated by formal instructional programs.

There are some factors beyond the student's present ability which limit what should be taught in driver instruction programs. Among these factors are:

1. ***Amount of available instructional time.*** Unfortunately, the amount of time students are willing to devote to instruction is generally limited. As a result the instructor must select the content that is most important to successful and efficient driving. Content that must be omitted, although important, could be assigned for outside reading. Even so, it is inevitable that some performance elements of a program will be omitted entirely.

2. ***Available practice areas, conditions, and situations.*** Selection of content for behind-the-wheel instruction is often limited by the availability of different types of roadways, and the types of traffic conditions and situations within a short distance of the student's home.

3. ***Environmental conditions.*** Certain aspects of driving will have to be confined to classroom instruction because specific environmental conditions don't exist. For example, certain geographical regions such as the far Southeast and Southwest rarely experience snow. Programs in these areas must limit coverage of these topics to verbal instruction.

4. ***Instructor's inability to control traffic elements.*** There are many aspects of the traffic situation that an instructor is not able to program to allow student drivers to practice specific maneuvers in reaction to movements made by other drivers. Behind-the-wheel instruction, in dealing with the actions of other drivers, must take place when and if the opportunity arises.

5. ***Amount of risk.*** Certain elements of behind-the-wheel instruction could involve some risk. Skid control practice, evasive maneuvers, and returning to the roadway after dropping off the pavement edge are examples. The instructor must consider the amount of danger involved to the student driver, to himself, to others, and to the property of others before making a final decision on whether to select certain maneuvers for behind the wheel instruction.

ORGANIZING CONTENT

In the organization of a training program, instructional objectives—performance, knowledge and skill—and the related content to be mastered are arranged into some logical order. A basic condition for the acquisition of knowledge, skill, and habit is the occurrence of learning experiences that are sequenced in terms of sound instructional principles. The problems the driving instructor faces in organizing instructional content are, generally speaking, less severe than those which confront the secondary school driver educator, because (1) the duration of instruction is generally shorter, and (2) the amount of classroom instruction is generally less making the task of coordinating classroom and in-car instruction much less of a problem in organizing the course. However, the problem does crop up particularly when the professional instructor is called upon to administer a state-organized program. In organizing content it is necessary to make sure that the knowledge acquired in the classroom is either necessary for, or enhances the learning of, skills and habits to be used in the laboratory or on the road.

1. Each instructional unit should have a specified instructional objective(s), and the information content should be logically and clearly sequenced to support it. Student drivers must know the objectives of each instructional unit, and the standards of performance they are expected to attain.

2. The material to be mastered must be reviewed occasionally. Some student drivers will not understand the material or learn procedures during their first exposure. Even those beginning drivers who learn initially may forget some materials or elements of procedures as the course proceeds. The instructor is obligated to aid student drivers in attaining instructional objectives. This contrasts with the view that the instructor's obligation is fulfilled by a single presentation of information.

3. Classroom experiences must be coordinated to occur close together in time. Most of the knowledge transmitted in the classroom is functional because it prepares the students for simulated or actual driving experiences. Therefore, classroom preparations should be followed by their related laboratory sessions. Ideally, laboratory instruction should follow classroom instruction very closely—separated by a short rest pause. Since the ideal is hard to attain, a brief summary of related classroom material should be given before beginning the laboratory experience.

4. Practice of procedures and development of skills should occur periodically. Effective learning typically requires repetition of attempts until successful performance is achieved. Prolonged sessions should be avoided. They may result in the development of undesirable driving behaviors because student drivers may become tired or bored, and they may adopt behaviors which may compensate for these conditions as well as interfere with learning good driving habits and skills.

5. Tests should be given periodically as a means of informing beginning drivers and teachers of progress, and for reinforcing successful performance.

6. Student drivers should be held responsible for all previous course material at any point in the course. The goal of a course is to help young drivers meet the instructional objectives at course completion. Consequently, periodic review and retesting are necessary to overcome the effects of forgetting or incomplete learning.

Specific guides for in-car instruction sequencing are:

1. Teach preoperative procedures first.

2. Teach fundamental procedures and skills, e.g., speed control or steering control, before teaching the more complex skills which require the driver to use two or more skills, e.g., turning.

3. Provide classroom instruction or a predriving orientation on concepts, procedures, and other information prior to behind-the-wheel instruction.

4. Expose new drivers to the less complex procedures and skills and content information first, i.e., instruction should progress from the simple to the complex.

Selection of Instructional Methods and Media

INTRODUCTION

Once the instructional content appropriate to established course objectives has been identified, it is necessary to select the instructional media through which students will develop the required knowledges, attitudes, skills and habits. For purposes of discussion, media can be divided into four categories, corresponding to the location of instruction (1) the classroom, (2) the simulator, (3) the driving range, and (4) the street. The majority of instruction administered by today's professional driving instructors consists of behind-the-wheel training in an operational automobile. However, if the level of competence of professional instructors is to be upgraded to a level approaching that represented in countries where driving schools are the dominant form of instruction, then instructors must be capable of utilizing all relevant instructional approaches. For professional instructors who wish to be capable of administering programs within the secondary school system such broad preparation is a necessity.

Discussion of each category of instructional media will focus upon the characteristics of the media, their relation to various types of instructional content and their ability to contribute to effective instruction. The actual use of the media during the administration of a course is discussed in the section on Curriculum Administration.

CLASSROOM INSTRUCTION

Classroom instruction in driver education should prepare students to drive by providing those fundamental knowledges and instilling those attitudes that are prerequisite to becoming a safe and efficient driver. Classroom experiences may achieve these goals directly and indirectly. Some classroom-transmitted content is directly applicable to the driving task and does not require a laboratory experience to insure that the driver education student will learn. Other classroom content prepares the student driver for laboratory lessons directly related to the driving task.

Traditional methods of instruction are applicable. The lessons must support the attainment of specific and realizable objectives that are ultimately related to safe and efficient driving. Preparation of the lesson involves detailed lesson plan construction, including the selection of particular classroom teaching techniques, audio-visual aids, and textbook assignments. Since many lessons will prepare the beginning driver for laboratory work, the classroom activities must be planned to integrate the classroom and laboratory periods through the specification of objectives, selection, and sequencing of content and designation of teaching methods.

Goals

The student should know the goals of classroom instruction as a part of a driving instruction program.

There are two important goals of classroom instruction, both basically performance oriented (1) the transmission of facts and concepts and, in courses with a practical orientation, the transmission of procedural information as well; and (2) the preparation of the student driver for other learning experiences. In the latter, the knowledge transmitted in the classroom is considered "enabling" in that its acquisition enables the student driver to engage in other learning experiences with the prospect of a reasonable degree of success.

Classroom experience readies the student driver for laboratory instruction, including behind-the-wheel training. Its ultimate purpose is to provide the beginning driver with a foundation of knowledges and skills, generally enabling information, that he may develop to the point where he can receive practical behind-the-wheel instruction. In addition, a great deal of the information transmitted to the student driver is motivational in purpose. It consists of information concerning the highway transportation system and its potential hazards. This information will develop within the student driver those attitudes that lead him to the application of safe driving knowledges and skills.

Requirements

The student should know the requirements of the classroom experience.

Each class must be goal-oriented, with explicit and realizable objectives to each lesson or session. Student drivers must be told the specific instructional objectives to be attained, the specific level of achievement or standards they are individually expected to meet, and the manner and mode of classroom examinations designed to test their progress.

Lessons must be organized logically with appropriate content material to support the main points. (The section on Lesson Plan Development provides a detailed description of the development of lesson plans.) There is no substitute for a well organized classroom experience, and it is difficult to achieve one without a well developed plan. Organization has been shown to be more crucial than the media (instructor, film, programmed instruction) that may be used for presentation of the material.

For a satisfactory classroom experience, all participants must be prepared for the lesson. The instructor must develop and/or review his lesson plan, reference material, and teaching aids, arranging for audiovisual aids or other special equipment. Handout materials must be prepared in advance so that they are available at the beginning of each class. Beginning drivers should have completed their assignment which will give them the appropriate background material for the lesson or provide the focus for further examination during class.

Use of the appropriate media and aids will enhance the effectiveness of the classroom experience. The purpose of instructional aids is to provide experiences for the student drivers which are of a quality and scope that exceed the quality of the instructor's lecture materials. Such instructional aids—films, filmstrips, and other materials and devices—should not be selected for their own sake; rather, they should be introduced only when they will make the curriculum more effective.

The instructor must preview films and filmstrips to determine their suitability as an instructional aid to specific lessons. In previewing the material, the instructor should develop a synopsis of the presentation. The synopsis should state running time of the film or, if applicable, specific sequences in it, and should indicate the points where the projectionist is to stop the film to permit the instructor to make a point.

Audio-visual materials should never be a substitute for an absent teacher. They must always be used with the instructional program. If a film is not an integral part of the lesson, the beginning drivers may regard the classroom hour as a vacation from the normal routine and develop a "recreational" attitude toward films.

The appropriate use of films and filmstrips is to convey information which the student drivers must retain. Before the film is shown the instructor must inform the beginning drivers that he will hold them responsible for the content.

Methods

The student should know the applicable presentational classroom methods.

Classroom methods are primarily "presentational" in that the instructor serves as the medium for the presentation of facts, concepts, and procedural information. He augments his presentation with written material such as textbooks, pamphlets, films, filmstrips, and demonstrations.

The instructor's presentation must exhibit several crucial characteristics. First of all, the level of difficulty, the vocabulary and sentence structure the instructor uses should be adapted to the group he is teaching. Secondly, the rate at which the instructor speaks or lectures must be regulated to permit the class to take handwritten notes. It is very difficult for a student driver to listen and record simultaneously the instructor's presentation, and the problem is compounded by a novice instructor who tends to speak too rapidly. It will be helpful to beginning drivers if the instructor prepares and distributes written outlines of the major points of the classroom presentation.

The third crucial characteristic is the manner of the presentation. Since driving a car is a serious responsibility, the presentations that help teach student drivers how to drive should also be serious. They need not be stern or solemn, but they should not be so jocular that they cannot be taken seriously.

At the first meeting, the instructor should give each class member a copy of the course syllabus and acquaint them fully with the course—its major purpose and objectives, testing procedures, and other requirements. He should outline the rules of conduct the beginning drivers must observe during lectures and examinations, not emphasizing the punitive consequences of their deliberate failure to adhere to important rules. The class will react negatively to a punitive attitude.

Questions from Students and Teacher

There must be an allowance of time during and/or at the end of each lesson for the class members to ask questions. An alternative or augmenting procedure would be for the instructor to ask questions of the student drivers during and at the conclusion of each lesson. This procedure would not only be helpful in determining the general effectiveness of the presentation but it would also motivate them to prepare assignments and to pay attention during class.

It is difficult to develop a purely voluntary question and answer interchange between instructor and student drivers and still assure involvement of the majority of the class. So that the entire class will benefit, the instructor must use his skills to deal with questions, rephrasing them so they are understood by the beginning drivers and can be answered fully. Student drivers are frequently unable to articulate accurately the point they do not understand. When this situation exists, the instructor must take such questions and develop them so that his response is effective.

He must avoid devoting too much time to questions that concern a limited number of the class members. It is not realistic to expect that the entire class will completely understand all the material at any one time. If the difficulty appears to be idiosyncratic, the instructor, after a reasonable attempt to answer the question, should continue the discussion with a particular student driver after class.

Irrelevant questions must be handled tactfully, because such questions may indicate that the student driver has misunderstood a point. The instructor must return the questioning to its proper perspective without making the neophyte driver feel he has been deficient in his understanding.

Frequently a beginning driver will ask a question that seems so incoherent the instructor isn't able to identify the specific problem. In such cases it will be helpful to go back to the point in the presentation that puzzles the student driver and recapitulate that section of the presentation.

Resource Individuals

The instructor may wish to ask an acknowledged expert in some aspect of the highway transportation system (e.g., police officer) to give a lecture or demonstration to the class. This practice will be largely confined to programs operated within the public school system. Apart from the instructional value of such an experience, the change of face and the change of pace may help to maintain student driver interest in the course. However, the use of the resource person, like the use of any instructional aid, must meet a specific instructional requirement identified in the lesson plan. He should not be asked to give a presentation unless the content is suitable to the block of instruction being currently presented to the students.

Very often resource people will come with equipment or other material which, while relevant to their own function, is not relevant to the material being covered in the class. Unfortunately, the equipment the resource person brings with him may be more fascinating than the information he is supposed to convey. Too much time may be spent looking at the squad car and its accessories, watching the operation of a breath tester, and so on.

Normally the class should be held responsible for the most relevant material presented by the resource person. Since it may be difficult to apply the same type of control to this kind of presentation as can be applied to a film, it may be necessary for the instructor, after the presentation has been given, to redefine the areas for which the students will be held responsible.

The instructor should keep in mind that it is not always possible to acquire the services of a resource person on short notice. Consequently, arrangements should be made well in advance so that the guest's presentation can be properly integrated with the course.

Field Trips

A visitation to a traffic court, department of motor vehicle testing station, or a specific highway traffic site can strengthen beginning drivers' knowledge. Again this technique is most appropriate to public school programs. In planning a field trip, the instructor must be sure that it will be an integral part of the curriculum, determining at what point in the lesson the trip will be helpful and scheduling it accordingly. It should not be set up or administered in a manner that makes the neophyte drivers feel they are getting a "day off" from the class.

Before the visitation the instructor must give the class the proper orientation so each class member will know what to look and listen for, and afterward, he must review the experience with the class. The class should be held responsible for the content of the field experience.

The inherent difficulty with a field trip is the potential inability of the instructor to control the experience. A visit to a police station, for example, can provide information and experiences relevant to driver education, and foster a better attitude of young people toward law enforcement agencies. However, the beginning drivers will also see and be interested in areas at a police station that are not relevant to driver education—the pistol range or cell block area, for example. The instructor may have difficulty guiding and holding the interest of the class in the applicable area, and the result may be a considerable waste of valuable time.

Demonstrations

A demonstration is an illustration of a fact or principle. This teaching technique is frequently costly, requiring a great deal of preparation to be effective. When the instructor believes he will be unable to make his point with lecture, textbook, films, or filmstrips, he can utilize a demonstration. The demonstration gives a realistic illustration of a crucial fact, such as automobile braking distance or skid control. Before deciding to use this technique, the instructor must first identify the requirement for demonstration through a study of the objectives in the course and the specific lesson plan. Then he must determine if the degree of realism required excludes the use of films or filmstrips. Finally, he must identify in advance the salient features of the demonstration for the class members and hold them responsible for the information conveyed in the demonstration.

The student should know the interactive teaching methods for classroom instruction.

Interactive teaching methods are procedures of instruction in which a class member takes an active part—group discussions, role playing, programmed instruction, projects, and problem-solving activities.

Interactive techniques should be used when the objective of instruction involves more than the mere communication of information, as for example when the objective of the instruction is to influence the beginning driver's attitude or when it is desired to have the neophyte driver play a highly active role in the learning process.

Group Discussion

In a group discussion, the class is presented with a topic or probelm to be solved and class members offer their views and solutions. The instructor of a student driver acts as a moderator and attempts to guide a discussion toward a specific end result. For example, the instructor might introduce the topic of drinking alcoholic beverages prior to driving in the hope of molding the attitudes of the class negatively toward a combination of drinking and driving. The group discussion approach is particularly well suited to court-operated "remedial" programs which frequently involve professional driving instructors.

It is unlikely that the beginning drivers' attitudes or thought modes will be meaningfully changed by an occasional exercise in group discussion. It is particularly difficult for an instructor to lead a discussion to a constructive conclusion when faced with a concrete problem. It is even more difficult to use the group discussion technique to modify attitudes and beliefs.

The technique can be employed for the analysis of information content if the instructor is skillful in the guidance of discussion and can strike a balance between a discussion that does not have enough guidance and one that is inhibited by too much guidance. The technique should be used only by a well prepared and exceptionally skillful instructor where it will satisfy a specific educational requirement.

Role Playing

This technique is intended primarily to effect attitude changes. It requires two or more individuals to assume the roles of people involved in a problem under discussion. Through their attempts to adopt the points of view of the individuals in a hypothetical problem, the student drivers should learn to better understand similar real life situations. For example, members of the class could assume the roles of a traffic officer or traffic court judge and a driver cited for a violation of the motor vehicle code. In adopting the role of the traffic officer the driver education student may achieve a better understanding of the problems and difficulties of traffic law enforcement.

Effective role playing exercises require a considerable amount of sophisticated planning by the teacher and consume a great deal of time, particularly if all class members are to adopt a role. Indeed, unless all class members do adopt some role in the problem under discussion the exercise in role playing is more likely to be a demonstration than a successful effort at individual attitude change.

Programmed Instruction

Programmed instruction is a technique in which the rate at which the student receives material is dependent upon his success in mastering the information. The medium for the presentation of material and the assessment of the learner's progress may vary, from written manuscript to computers. The heart of the instructional process is well specified objectives, and well-organized material, critically placed and frequent tests to determine whether the learner proceeds to a new block of instruction or receives remedial instruction.

While the programmed instruction technique can be applied to the classroom content of driver and traffic safety education, a considerable investment is required to develop it effectively. Unless the instructor has an abundance of time and energy as well as technical skill in programmed instructional material development, this technique should not be undertaken.

Projects

Projects are individual efforts which presumably lead to better individual understanding of the given problem. When the project method is used, there is the assumption that it will be more economical and effective than other available teaching procedures. A project frequently will involve the entire class, each class member being asked to collect information relevant to some specified topic and to prepare a brief report. Projects may include an interview with highway traffic safety officials, the construction of traffic safety posters, and many other activities.

The instructor must take the time to make this learning activity profitable. Indeed, he must assure himself that the benefits of the activity will justify the amount of time he will have to devote to it. Class members will need individualized attention in the preparation of their assignments and for their successful involvement in the project activity itself.

While a project may provide some novelty in the course, the introduction of novelty is not a sufficient reason for the use of a project activity. The activity must have a reasonable guarantee that it will provide the class with information that cannot be more economically obtained by the use of other learning procedures.

Problem Solving

Problem-solving activities are utilized when the instructor feels that the driver education student will not learn unless he is involved in some form of analytical activity. For example, the instructor might portray a hazardous traffic situation on a situation analysis display as a means of involving the beginning drivers in the solution of basic driving problems. The underlying assumption is that through a process of discovery the neophyte drivers will derive more benefit than they would if the instructor were to describe and analyze the problem himself. There is no basis in fact for such an assumption. Learner involvement in the problem-solving activity may increase their interest in the course, but it is unlikely that they will by themselves discover highway traffic safety principles without considerable assistance from the instructor.

The problem-solving activity is more likely to be successful if it is highly structured by the teacher and is preceded by instruction in the concepts that the students are expected to utilize in solving the problem.

The student should know how to use tests in the classroom.

Knowledge test achievement scores furnish the instructor with concrete information on the effectiveness of the course and the extent of the learner's achievements. Such information should be used as a guide for the refinement and development of the course and for diagnosing learning problems. Each test should be designed as a learning experience. To be useful the test must have the following characteristics:

1. The questions should be a truly representative sample of the knowledge content being tested. The number of questions on a particular topic should reflect the criticality of that topic.

2. Questions should be carefully constructed using a vocabulary and sentence structure understandable to the students being examined.

3. The method of indicating answers should be simple to understand and perform.

4. The amount of time for learners to answer the questions should be adequate.

5. The test should be scored and the results given to the class as soon as possible in order to make the test experience an effective learning procedure. The longer the delay in getting results of a test to the students, the more the examination loses as an effective learning tool.

6. The learner should be given complete information on the test results.

Classroom Media

The student should know the types of media that are available and how they can be used to augment instruction.

Classroom media transmit information, visually and auditorially. They include films, filmstrips and slides, transparencies, multimedia systems, photographs, chalkboards, traffic situation display boards, and cardboard or paper mock-ups. The instructor may also be considered part of the instructional media since he transmits information. However, the present discussion is limited to media that are purchased rather than salaried. These devices and materials can be a very effective part of the teaching program, provided care is taken to assure their relevance to the instructional objectives of the course and to the lesson in which they are to be used.

The types of the materials available to the driving instructor, as well as their range of application, are extensive. A substantial amount of material pertaining to various subject areas is also available, including the description and function of the highway transportation system, basic vehicle control tasks, normal driving procedures, emergency driving procedures, such off-roads, non driving topics as the driver's general physiological and psychological well-being and his preparedness to drive, the legal requirements for both driver and car, and the operation of state and local governmental units and agencies.

Classroom media are not a substitute for the instructor. Rather, they augment his instructional program. The instructor must develop an effective program by selecting and utilizing aids that can enrich the learning experiences of the student driver. It is unlikely that any currently available instructional aid can be an effective substitute for portions of the instructional material that should be included in a safety-oriented course. Therefore, the instructor must study thoroughly the objectives of the course, checking the instructional media available to enhance the learning experience and selecting those that are appropriate on the basis of their applicability and economy. Subsequently, he must fully integrate these aids within the classroom program, adhering to general guidelines for their use (see the section on Curriculum Instruction).

Various commercially available instructional aids are listed in other sections of this Instructor Guide. While some preliminary screening of these sections has been performed, the material in these sections is more of a "catalog" than a recommended list. Programs and policies of individual driving schools will require the instructors to choose among selected alternatives in constructing their educational programs. With the catalog, the instructor will be aware of a range of alternatives. He can study the various devices and materials to determine their suitability to the goals of driver and traffic safety education, and the curricular and economic requirements that define the context in which he develops his material.

Films

While professional driving schools have generally made little use of instructional films, it is important that instructors be familiar with (1) the strengths and weaknesses of films as a medium, (2) the proper use of films, and (3) the available sources of driving films. Motion picture films in 8 and 16 mm, black and white or color, with or without sound, are widely available. Modern motion picture projectors are fairly simple to operate although an instructor should seek some instruction in their operation and routine maintenance.

Application

A variety of topics related to driver education and traffic safety are dramatized in motion picture films, which are available from a number of different sources and referenced in each unit of this Guide. They offer a rather wide range of application.

They aid in the learning of perceptual responses associated with defensive driving by illustrating conditions a driver should watch for (emerging road hazards) or behaviors he should acquire (scanning the environment, following at a safe distance, using the right of way with caution).

Films can also be valuable in the development of perceptual skills. They can enhance skill development by pointing out cues for specific driving requirements or by drawing attention to specific problems. Film presentations, which usually are packaged units containing charts, graphs, or illustrations with applicable narrations, can offer knowledge content of specific situations with which students should be familiar before they engage in further classroom study or related laboratory or on-the-road driving experiences. While most films are not of sufficient quality to allow students to develop highly accurate perceptual skills, they are, nonetheless, a helpful and needed prerequisite to perceptual skill and hazard recognition training.

Motion pictures can also demonstrate a great variety of driving behaviors, particularly those that involve a dynamic interaction among vehicles. These behaviors include smooth merging into traffic upon entering and leaving freeways, the consequences of tailgating or needless lane changing at high speed, the consequences of split-second decisions and the need to plan ahead, or the need for making driving adjustments under adverse weather conditions.

The stop-frame technique—stopping a film at a designated point—is a use of films which permits specific points of the driving situation to be discussed as they are depicted. The technique can be used to teach emergency reactions, for example. As a developing hazard reaches a climax, the film is stopped so that various aspects of the emergency can be discussed. A similar approach is the "flash film" technique which uses slides to portray hazardous situations.

There are some disadvantages to films as an instructional medium. For one thing, they are costly and should be purchased only when it is apparent they will fill a need more efficiently than any other medium. Secondly, they are demanding of the instructor's time. Most films will cover a number of different problems or situations, perhaps only one of which will be applicable to the lesson plan at hand. To avoid using irrelevant portions, the instructor must preview the film, selecting only the content that supports the objectives of a given class period.

Filmstrips and Slides

Filmstrips are 35 mm, color or black and white film segments that vary in the number of frames. They require a special projector, one that advances the film a frame at a time, either manually or automatically, from a signal generated by a cuing device. For best viewing, filmstrips should be shown on a motion picture screen. Some devices come equipped with a correlated audio presentation which also contains a cuing message to advance the film. This type of device results in a completely coordinated audio and visual presentation.

Commercially available slides are typically 35 mm, in color or black and white. Slides can be prepared by the instructor using 35 mm film and a commercial processing source, or by using a Polaroid camera with a special attachment and slide processing materials. Projectors for 35 mm slides are available from a number of commercial sources. They can be obtained with correlated audio equipment. An alternative is to correlate audio with the slides, using a reel-to-reel or cassette recorder and manually triggering each slide.

Application

Filmstrips and slides can be used to transmit factual, procedural, and conceptual knowledge for a variety of driver and traffic safety education problem areas. In many respects they are comparable to motion picture films in the transmission of this kind of information.

They also can assist in the development of perceptual skills. Pacing the materials, as this technique permits the instructor to do, is more than an adequate substitute for a stop frame motion picture technique. An illustration—for example, the development of hazards or other driving emergencies—may be effectively portrayed with the instructor directing the students' attention to the features of the presentation before progressing to more dynamic presentations, such as the motion picture film in which the emergency situation may arise so rapidly that the students fail to recognize the factors in the development of the problem.

Generally, filmstrips and slides can effectively do all that a motion picture film can do, especially if the correlated audio or the instructor's script is effective. A reel-to-reel or cassette tape recorder script can be prepared in advance by the instructor. Manual cuing of the projection device will coordinate the verbalization and the projection of the image. An additional advantage is that it permits the instructor to pause for an additional period of time to answer questions. The fully automatic cuing is more difficult to override.

With this technique, the instructor is able to preplan, organize, and develop standardized presentations keyed directly to the instructional objectives he must meet. Examination questions can be interspersed throughout the presentation, with the students recording their answers on a standardized answer sheet. The use of a tape narrative makes it easy for the instructor to attend to the students who are answering the test question.

The versatility of this technique is another advantage. The instructor can take pictures of local traffic scenes and make his own slides and filmstrips to illustrate driver and traffic safety education problems in the context of the environment with which the students are familiar. This enhances the realism and significance of the course and makes the students more keenly aware that the instructor is not discussing hypothetical problems, but rather, real life problems they must solve.

There are some disadvantages to the use of filmstrips and slides. They are more costly than still photographs or other methods, and they are less realistic than films in portraying dynamic situations. In addition, commercially prepared materials may not be adequately addressed to the objectives of the course, and for the instructor himself to produce teaching materials, he must have the time and the funds.

Transparencies

Transparencies, which can be shown on an overhead projector, vary in size from just large enough to be visible to an 8 by 10. This system is frequently used to display the line drawings, graphs, and charts made by the instructor. Normally the instructor provides the narrative to accompany the projection; however, the visual presentation could be correlated with a prepared audio narrative.

Application

The range of application of transparencies is narrower than that of slides or filmstrips. Their use is restricted principally to the display of figures, charts, schematics, and verbal information. They can alse be used as a lecture aid particularly in an auditorium or large classroom. Typically, a lecture presented to a large group is subjected to a considerable amount of distraction from the shuffling and movement of large numbers of students. This makes it necessary either to hand out material or to outline the lecture on the chalkboard. The latter is essentially a waste of time, because in a large room or room with poor seating arrangements the chalkboard may not be clearly visible to all students. By using a projector and transparencies, these difficulties can be overcome.

Directions for making transparencies are not complicated. Clear acetate notebook page covers, approximately 8½ by 11 in size, should be obtained. These acetate covers are normally folded in half. The covers should be opened and the outline of the lecture written on the acetate sheets with a felt marking pen or grease pencil. A sheet of white paper should be placed behind the acetate to make it easier to see the writing on the acetate. The transparency must be shown without the paper backing, however. The lecture outline should be placed a page at a time on the projector with a sheet of paper covering it to block the projection of the transparency until it is needed. Then each item of the outline is uncovered as it is introduced and discussed. If all the page is uncovered at once, the students will spend their time copying the outline, not paying any attention to the lecture until they have completed their copying.

Instructor preparation is always important. If the transparencies are charts, graphs, or schematics, the oral presentation should include all the explanatory information required to fully interpret them. The material must be well organized and legible.

Multimedia Systems

Commercial multimedia systems are 16 mm sound motion picture projectors and filmstrip projectors that are controlled by a cuing device. The control unit allows the instructor to switch automatically between the two media to take best advantage of content and degree of required realism in each medium. Commercial programs also typically contain slide projections of multiple choice questions. Students are directed to answer each question individually by depressing a small pushbutton response indicator device. Impulse counters in the instructor's console accumulate points for correct answers on an individual and group basis. An optional programming unit can be obtained that allows the instructor to develop his own switching sequence for films and filmstrips which he may produce locally. The content of commercially available programs samples many areas of driver and traffic safety education, including, for example, emergency driving procedures, basic driving skills, rules of the road, and citizenship.

The principal asset of the hardware combination is the control mechanism which allows the instructor to prearrange the efficient classroom use of motion picture and filmstrip materials. The student response mechanisms and counters are another potentially useful feature.

Application

The instructional capability of this system is essentially the same as that contained in the individual motion picture and filmstrip projector media. It should be used as these media are used–to develop knowledge and perceptual skills.

An added feature of a multimedia system is the student response mechanism. If the question material in the commercial programs is good, the testing will be an aid to learning and instruction. The immediate feedback provided in these films is an acknowledged aid to learning.

There are drawbacks to the system, however. The student response units are connected to the instructor's console by cables which, unless hidden, tend to clutter the room. The cost is, of course, much higher than paper and pencil testing.

The production of material, which includes the programmed use of both systems, forces the instructor to spend a great deal of time organizing his strategy and content. This is highly desirable.

Photographs

Black and white or color photographs may be used to illustrate such factors as highway characteristics, effects of crash forces on the car, instruments, and other mechanical features of the car, and signs and roadway markings.

Application

The principal use of photographs is to transmit knowledge or to illustrate the verbal content of lectures. They are unlikely to assist in the development of skills.

Chalkboards

The chalkboard is an inexpensive graphic aid with which all instructors are familiar.

Application

With a chalkboard, the instructor can present diagrams of traffic and highway situations, illustrate signs and roadway markings, show location of controls and displays on the automobile instrument panel, and depict instruments and controls schematically on a large scale. In addition, he can present student assignments and lesson topic outlines, list discussion points for the lesson, and present examination material.

The chalkboard is probably the least effective way of transmitting large amounts of written material to the students. If the instructor writes large enough so that all students can see, the board must be erased frequently in order to present more information. If the instructor writes in a small hand, some students will not be able to see the material or read it easily. In addition, students who spend their time copying material from the board are unable to devote their attention to any information presented orally. The use of written handout material will be much more effective.

The effective use of the chalkboard illustration to portray signs, markings, and highway traffic situations is limited by the artistic ability of the instructor and the artistic ability of the students who will attempt to reproduce the illustration in their notebooks.

Traffic Situation Display Boards

Traffic situation display boards can be used to illustrate the configuration of highway intersections or other roadway characteristics. The instructor can construct a variety of roadway configurations with the adjustment of movable pieces on the board. The traffic situation display board is an alternative to a chalkboard illustration.

Application

These displays can be used to illustrate traffic problems for discussion by the class to maximize their participation and interaction with the instructor. Thus, the display boards are an aid to the classroom techniques involving group discussion and problem solving.

There are some advantages to the use of a traffic situation display board. The effectiveness of the presentation is not dependent upon the artistic ability of the instructor as it is when chalkboard illustrations are constructed, and the display can be varied in response to students' analyses of traffic problems. The result is a display with far greater flexibility than those projected by slides or filmstrips.

Because the range of situations that can be shown on the display board is somewhat limited, the usefulness of the display is somewhat narrow. Further, the rearrangement of the board from one situation to another does require class time.

Mock-Ups

Mock-ups are low cost representations of equipment, generally fabricated from cardboard or paper, intended to acquaint students with the physical appearance of the equipment. They are entirely nonoperational—that is, nothing really "works." They are intended merely to teach location and recognition of various equipment components. The cost of mock-ups is normally very inexpensive when compared to the cost of purchase and use of operational equipment.

Application

Large cardboard and paper mock-ups can be used to illustrate the instrument panel of the car and show the location of controls. These aids are useful in presenting knowledge and in the development of some procedures. They can be a substitute for a chalkboard in presenting knowledge information. Cardboard instrument panels the size of the students' desks can be placed before each student. Students are then led through a drill which allows them to learn the types and location of a car's instruments and controls. Cardboard mock-ups of this type have been found to be very effective even in the training of pilots to perform cockpit procedures. The lack of realism may be a slight problem. However, the instructor's abilities can overcome this.

Scare Tactics

A standard part of many driver and traffic safety education programs is the appeal to fear, typically through films or other graphic aids. Several approaches have been employed, ranging from the suspenseful "rendezvous with death" motif to stark exhibits of actual accidents, graphically detailed. From a survey of "scare" techniques, Malfetti and Warner have concluded that most have been used with good intention but with little foundation.

In one of the earlier studies concerned with this subject, Janis and Feshback found that the strong use of emotional appeal with negative connotations was not an effective means of influencing behavior in a specified direction. Since that time other studies have corroborated these findings. The explanation usually offered is that the viewer tends to avoid the fear-producing material, thus negating any motivational effect it might have. This type of response has come to be known as the defensive avoidance reaction. There is further evidence, though not definitive, that an arousal of strong fear may actually induce accidents. A possible explanation is offered by other research which has shown that spread of muscular tension accompanying anxiety can cause behavior patterns to break down and reduce perception. Finally, the effectiveness of the scare communication has been shown to depend upon its source: If the communicator is viewed as unqualified, the message might either be ignored or produce effects opposite from those intended.

In the area of driver safety, Merrill discovered defensive avoidance reaction in those viewing a filmed drama in which a careless driver kills a traffic officer. An attitude change opposite to that desired occurred among the viewers immediately after the showing, to return to its original level ten weeks later as the avoidance effect dissipated.

In summary, the use of scare techniques poses a greater threat to the students receptivity to safety instruction than it does to whatever unwholesome attitudes he may harbor. The use of positive factual information is more likely to foster the attitude change desired. Blatant fear producing material should normally be omitted from driver and traffic safety education courses.

LITERATURE CITED

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education*, MacMillan, New York, New York, 1966, pp. 168-186.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education.* Automotive Safety Foundation, Washington, D.C. 1970, pp. 152-161.

Brody, L. and Stack, H. *Highway Safety and Driver Education*, Prentice-Hall, Englewood Cliffs, N.J., 1954, pp. 172-196.

Cook, Dean R. "Multimedia—A Classroom Concept," *Traffic Safety*, vol. 68, no. 4, April 1968.

Goodman, Louis S. "Training Aids" in Craig, Robert L. and Bittel, Lester R. (educators), *Training Development Handbook*, McGraw Hill, New York, 1967, pp. 310-337.

Janis, J. and Feshback, S. "Effects of Fear-Arousing Communications," *Journal of Abnormal and Social Psychology*, vol. 48, 1953, pp. 78-92.

Malfetti, James L. "Scare Technique and Traffic Safety," *Traffic Quarterly*, vol. 15, no. 4, April 1961, pp. 318-330.

Merrill, I.R. "Attitude Films and Attitude Change," *Audio-Visual Communication Review*, vol. 10, no. 1, January-February 1962, pp. 3-13.

Silver, Gail H. "Driver Education and the Multimedia Response System," *Journal of Traffic Safety Education*, vol. XIX, no. 1, October 1971, pp. 11-12.

U.S. Department of Health, Education, and Welfare. *Training Methodology Part IV: Audiovisual Theory, Aids, and Equipment—An Annotated Bibliography*, U.S. Government Printing Office, Washington, D.C., 1969.

Warner, William L. "The Use of Fear-Arousing Communications in Driver and Traffic Safety Education," *Journal of Traffic Safety Education*, vol. 18, no. 3, March 1971, pp. 15-16.

SIMULATOR INSTRUCTION

Professional driving schools have made little use of simulators for a number of reasons. First, the type of simulator predominantly in use today is most cost-effective for large classes rather than the individual instruction that has characterized most driving school programs. Secondly, they have been frequently proposed as a partial substitute for the on-street instruction that most professional driving instructors feel is extremely important.

However, because professional instructors are occasionally involved in secondary school programs, they should be familiar with driving simulators. Moreover, the nature of simulation is changing in a way that makes it more a useful adjunct to on-street instruction rather than a substitute for it.

Types of Driving Simulators

The student should know the basic types of driving simulators.

Simulator instruction in driving instruction employs electro-mechanical devices and programmed films to reproduce situations likely to occur in the real driving environment. The simulator provides sensory input similar to what the driver will receive in the actual environment, and the driver is required to respond correctly. The instructional programs cover a variety of driving situations and conditions. Simulation equipment can be placed in a classroom or installed in a trailer and moved from one school to another.

Although the motion picture driving simulators are the most publicized and accepted, other types exist. The most noted are:

> The Point Light Source. In this simulator the image of a landscape is projected on a screen by means of a light from a small source through a transparency on which objects have been either placed, painted, or photographed. The transparency moves in response to the operator's manipulation of the controls so that an illusion of driving through the landscape is created.

Model Vehicles. The display consists of a model vehicle which either moves along a stationary roadway or is positioned above a moving belt representing the road. Speed and/or direction are under the operator's control.

Remote Control TV. This simulator is equipped with a television camera that is driven across a scale model environment. The image from the camera is projected on a screen in front of the driver. This display will change in response to the driver's control manipulations.

In the most sophisticated form of television simulator, both the camera and projector are linked to the driver's head by means of a helmet linkage system. This system allows the driver a 360° field of view.

Computer Generated Displays. In this simulator, the display is created synthetically by means of computer-generated images representing the roadway, other cars, objects along the roadside, and so on. The pattern of images changes in response to the driver's control manipulations.

The point light source, model vehicle, remote TV, and computer-generated display simulators have in common the fact that the visual stimulus to which the driver responds will, in turn, respond to his control actions, setting up a continuous "closed loop" interaction between the visual display and the driver. In a motion picture simulator, the display is "frozen" on film and is therefore unable to respond to the driver's control manipulations. Lacking a continuous interactive stimulus/response relationship, the motion picture simulator is called an "open loop" simulator.

Since the visual display in a closed loop simulator responds to the driver's control manipulations, there is of necessity a one-to-one relationship between visual display and driver. This means that open loop simulators can accommodate only one driver at a time, a fact that renders them somewhat expensive for use in large classes. The open loop film simulator, because it allows many students to share the same visual display, is much better suited to classroom use.

The most widely used driving simulators are those developed for AEtna Life and Casualty and Allstate Insurance. Both the AEtna and Allstate systems utilize motion pictures and have mock-ups of the driver's seat. The student drives the car (simulator) in response to cues presented in the training film. Both the AEtna and Allstate system are open loop simulators; consequently, the visual display does not respond in any way to control movements made by student drivers. As many as 24 units, each containing the instruments and control found in actual automobiles, may be set up in a simulator laboratory.

Training Value of Driving Simulators

The student should know the training value of driving simulators.

Many driver education programs utilize the simulator method of instruction. Some instructors feel that driving simulators are a valuable supplement to the total driver training program. Others feel they offer little educational benefit. To determine the training value of driving simulators, the following must be identified and examined:

The overall objectives of driver education programs.

The capabilities of driving simulators in meeting the objectives.

The role of the instructor in the simulation program.

Each of these factors will be discussed.

An effective instructional system meets the overall objectives of the driver education program. If the objectives are accomplished the student driver will develop knowledge, attitudes, procedures, habits, and skills that will enable him to drive in a safe, responsible, and efficient manner.

Identification of these program objectives provides a basis against which the training value of driving simulators can be assessed.

Simulators and the Development of Knowledge

Driving simulators present information to students through an audio-visual system. Films cover a wide range of topics and a variety of driving environments and situations, including the driving environment, surveillance and hazard detection techniques, pre-operative and starting procedures, basic control tasks, and on-road emergencies.

Many simulator films are effective either with or without their audio. The audio will identify potential hazards and present knowledge items related to specific procedures. Or the instructor can turn off the audio and use his own lesson materials with the films.

It would appear, then, that driving simulators provide thorough coverage of driving topics. A few areas such as night driving, and skid control, do not lend themselves well in motion picture simulation, but overall coverage is comprehensive. Simulator films seem to present the information necessary to reinforce the effectiveness of the simulation laboratory as a method of instruction. A study by Bishop supporting this conclusion indicates that a simulator group compared favorably with a nonsimulator group in terms of acquisition of information. However, a legitimate question arises as to whether simulator films constitute a cost-effective medium for mere presentation of information.

Simulators and Development of Attitudes

Attitude is important to the driving task. The wrong attitude in a driver, even though he possesses considerable knowledge and skills, can create unsafe conditions for himself, other drivers, and pedestrians.

Driver attitudes are influenced by simulators, many driving instructors feel. Student drivers' visual experiences gained from simulator films provide subject matter for classroom discussions, which, in turn, help to establish high standards of responsibility. Some instructors feel that simulation of hazards encourages the student driver to develop defensive driving attitudes. That research has shown little correlation between simulator instruction and attitude development may be partly due to the lack of an adequate scale for evaluating driver attitudes.

Simulators and the Practice of Correct Driving Procedures

Simulators have been successful for teaching such procedures as engine starting, shifting patterns for manual shift cars, braking, steering, surveillance, signaling, backing, lane changing, and parking. The film(s) accompanying the simulation instructional unit identifies the procedures and provides instructions and commentary, and the students respond. It is possible for students to practice such procedures in the laboratory.

The instructor's role when a student driver is in the simulator is to identify his procedural errors and to help correct them. The lack of a motion system, together with the weaknesses of the programmed feature of the visual display, tends to withhold from the student important environmental cues which would indicate to him that he is doing something wrong. In the absence of such cues, the instructor must cue the student driver. In addition, he can utilize drills, proven effective in teaching such procedures as accelerating in manual shift cars and using the hand-over-hand technique when turning.

There are some procedures that involve motor responses—hand signals, wheel grip, use of mirrors, for example—which the recording equipment is unable to monitor. The instructor himself must check each student to see if he is performing these procedures.

The simulation recording equipment indirectly can monitor some of the student driver's perceptual responses. His reaction to a hazardous situation on the simulator film—a child darting in front of the car, for example—registers on the scoring mechanism. If the driver moves his foot from the accelerator pedal and applies pressure to the brake the instructor knows that the student has perceived the hazardous situation.

In summary, it appears that driving simulators can be an aid to the instructor in teaching driving procedures. However, their effectiveness in this capacity appears to be directly related to the ability and resourcefulness of the instructor.

Simulators and the Development of Habits

Procedures that can be learned and practiced in the simulator laboratory can become habit to the extent that the driver will perform them without having to think about them. Errors made by student drivers must be identified, either by the instructor or the simulator scoring system, and corrected so that incorrect procedures do not become habit.

Simulator instruction appears to be particularly effective in developing habits because of the ease with which responses may be achieved. Use of turn signals and a great variety of perceptual responses—registered through the students' precautionary use of accelerator or brake—may be called for until a high probability of correct response is achieved. Programmed films emphasize primary and secondary search areas, and the student, by analyzing the filmed traffic situations, learns to search and scan the driving environment for possible hazards. On the programmed films he sees many traffic situations that are virtually impossible to duplicate on the street. The fact that the sequences of the programmed feature of the visual system can be replayed and situations analyzed at length is an asset.

Simulators and the Development of Skills

In order to assess the capabilities of simulators for developing driving skills, the types of driving skills that must be learned, and the factors necessary for skill development to take place, must be considered.

Types of Driving Skills. Many skills are required to effectively control the vehicle. Driver education research, more particularly, driving task analyses, have been successful in identifying types of skills required of the driver. Among them are:

- Hand-foot coordination. This skill enables the driver to accelerate smoothly in manual shift cars and to maintain directional control at various speeds when driving on curved roadways.
- Perceptual skill. This skill enables the driver to estimate following distance, passing distance, and to position within the driving lane, and to "read" complex traffic patterns.
- Ability to execute a series of responses with precise movement and timing while under stress. This skill enables the driver to regain control of the car during a skid.
- Ability to react rapidly and appropriately in the face of an emergency situation. This skill enables the driver to select the best escape route and pump his brakes to reduce speed, both as automatic responses.

Factors Necessary for Skill Acquisition. The development of the first three types of skills listed above depends greatly upon kinesthetic and visual cues the driver receives in response to control movements he makes. The physical sensations and visual changes he experiences enable him to determine if his adjustments were appropriate and if additional adjustments are necessary.

Motion cues (kinesthetic feedback) received by the driver help him determine if he has applied pressure on the accelerator or brake too abruptly or too lightly; if he has properly coordinated clutch and gearshift lever movement; if he is driving at a speed too great for the curvature of the roadway; if he has entered a skid, and if he then regains directional control of the car.

The environmental changes as a result of control adjustments and as seen by the driver also help him determine whether those adjustments were appropriate and whether others are necessary. The driver's three dimensional view aids him in estimating separation distance, estimating passing distance, estimating closing rate of other vehicles, and positioning the car correctly in the center of the driving lane, while driving at various speeds and on roadways with varying degrees of curvature.

The fourth type of driving skill listed above—the ability to react rapidly and appropriately in the face of an emergency—is developed through repeated practice. The driver has developed the skill when he responds appropriately to an emergency situation as a matter of reflex.

Capabilities of Present Simulators in the Development of Skills

In present simulator systems the student driver responds to a completely programmed visual display. No changes occur in the display in response to control movements made by the student. And since the visual display is two-dimensional as well, situations requiring judgments in depth perception cannot be properly presented. These limitations, together with the lack of any motion system, preclude simulation of certain aspects of the actual on-the-street driving environment. The student does not receive critical cues he needs and uses when actually driving in traffic. These restrictions make it difficult to develop certain skills in the simulator laboratory. Skills that are difficult to develop here include:

Ability to coordinate clutch and gearshift level movement in manual shift cars to effect a smooth, gradual acceleration.

Ability to maintain precise directional control at various speeds when driving on curved roadways.

Ability to apply the appropriate amount of pressure to the accelerator and brake pedals when attempting to maintain an adequate separation distance.

Ability to recover from a skid.

Ability to estimate passing distance and rate of closure.

Despite these limitations, the simulator is a potentially powerful instructional tool in developing skills because of its ability to produce a wide range of visual stimuli "on cue." Skills that are well handled through simulation include the following:

Ability to interpret complex traffic patterns.

Ability to detect hazards represented by roadway and traffic conditions.

Ability to select an appropriate escape route rapidly when presented with an impending collision.

Ability to execute appropriate initial response rapidly when presented with an emergency of any kind.

To summarize—driving skill development in available simulated environment varies with the skill. The simulator's visual display restrictions, the absence of a motion system, and the absence of control display interaction limit the development of various control and perceptual skills. However, in simulators drivers can develop the ability to interpret traffic patterns, detect hazards and react quickly and appropriately in certain emergency situations.

The Role of the Simulator Instructor

The instructor is the key to the simulation program. Simulators are designed to help the instructor achieve course objectives. To achieve the objectives the instructor must be more than a projectionist. He must know how to utilize the instructor units effectively. This means he must:

Prepare lesson plans for each instructional unit.

Select supplementary material to aid in the presentation of material.

Monitor student performance by testing, utilizing the simulator scoring system, and observing student behavior.

Conduct drills for certain procedural tasks.

Correct and assist students having difficulty.

Research Simulators

The student should know the uses of driving simulators in research.

Simulators have proven to be valuable for research in the field of driver training. Their usefulness has been noted in a number of situations:

When hazardous driving situations or driver reactions to emergency situations require investigation in safety;

When environmental variables, such as weather conditions and illumination, need to be held under experimental control;

When driving conditions must be easily and continuously reproduced;

When indices of behavior (e.g., tracking), difficult to measure in real life, must be examined.

A research driving simulator is located at UCLA. It is a motion picture simulator that provides the driver not only with films of the road ahead and behind, but also a realistic impression of lateral car movement. Accelerator adjustments by the driver control the speed of the visual display, making it appear to pass by in proportion to the speed as registered on the speedometer of the car.

The General Motors Technical Center also has a motion picture research simulator. This device has a motion system which allows for changes in pitch and roll. Thus, forward, backward, and lateral acceleration can be simulated. The projector panning capability of the simulator controls lateral position and can indicate deviations from the desired path. Like the UCLA simulator, the visual scene changes in response to speedometer readings.

Terrain model research simulators have been developed by Goodyear and North American Rockwell, among others. This type of simulator utilizes an endless belt representing the roadway and a television camera that moves in two or three dimensions across a scale model of the road environment. The driver of this simulator manipulates the steering wheel, accelerator, and brake while observing the scene on a monitor or a projected television image. The driver's adjustments control the speed and direction of the camera movement.

RCA has also developed an endless belt simulator that consists of a standard automobile placed in front of a large viewing screen. An image of the roadway is projected and magnified by a system of lenses located directly behind the screen. The driver operates the car in response to the image projected on the front of the screen. The conveyor belt is controlled by the driver's actions. It speeds up as the accelerator is depressed and slows down as the brake is depressed. Lane changes can be simulated because the car moves laterally in response to steering changes.

BASIC REFERENCES

American Automobile Association. *Teaching Driver and Traffic Safety Education*, pp. 143-144, 298-299. McGraw Hill Book Company, New York, 1965.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, Washington, D.C., 1970.

Bishop, Richard W. "Evaluating Simulator Instruction for Accomplishing Driver Education Objectives, *Traffic Safety Research Review*, vol. 11, no. 1, pp. 12-17, March 1967.

Fox, James H. *Driver Education and Driving Simulators*, National Commission on Safety Education, National Education Association, Washington, D.C., 1960.

Gagne, Robert M., "Modern Learning Principles and Driver Education," *Concepts/For Traffic Safety*, vol. 4, no. 2, 1971, pp. 14-17, AEtna Life and Casualty Company.

Gustafson, Robert E. *A Study to Compare the Effectiveness of Instruction in the Allstate Good Driver Trainer and on the Multiple-Car Off-Street Driving Range*, Michigan State University, 1965.

Hoscovec, J. and Biehl, B.M. *Driving Simulators: Their Description and Use.* Paper presented at the Conference on Mathematical Models and Simulation of Automobile Driving, Cambridge, 1969.

Hulbert, S.B., and Wojcik, C. *Driving Simulator Devices and Applications.* Paper presented at the Automotive Engineering Congress, January 1964.

Hulbert, S.B. *et. al.*, "Driving Simulator Research" *Bulletin No. 261*, 1960, pp. 1-13, Highway Research Board.

Malfetti, James L. "Human Behavior Research and the Driving Simulator," *Proceedings, National Conference on Driving Simulation*, February 1961, pp. 57-79. Edited by Charles H. Hartman, Santa Monica, California, 1961.

McCormick, Ernest J. *Human Factors Engineering*, pp. 223-230, McGraw-Hill Book Company, New York, 1970.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, Human Resources Research Organization, Alexandria, Virginia, March 1971.

McKnight, A. James and Hunter, Harold G. *An Experimental Evaluation of a Driver Simulator for Safety Training*, pp. 5-18, Human Resources Research Organization, Alexandria, Virginia, Technical Report 66-9, June 1966.

Milliken, William F., Jr. "Advanced Simulation Techniques," *Proceedings, National Conference on Driving Simulation*, February 1961, pp. 45-56. Edited by Charles H. Hartman, Santa Monica, California, 1961.

Nolan, Robert O. "A Comparative Study of the Teaching of the Multiple-Car Off-Street Driving Range and the AEtna Drivotrainer," Michigan State University, 1964.

Schori, T.R. "Experimental Approaches and Hardware for Driving Research" in N. Heimstra (Ed.) *Injury Control in Traffic Safety*, C.C. Thomas Publishers, 1970.

Shettel, H.H., Schumacher, S.P., and Gatewood, R.D. *Driver Training Simulators, Ranges and Modified Cars: A Review and Critique of the Experimental Literature*, pp. 9-17, 33-41, 47-68. American Institutes for Research, Pittsburgh, July 1971.

Terhorst, Paul. "The Allstate Simulation Philosophy," *Journal of Traffic Safety Education*, vol. XVIII, no. 2, pp. 21, 30, January 1971.

Wojcik, D.K., and Hulbert, S.F. "The Driving Simulator–A Research Tool," *American Society of Mechanical Engineers*, 1965.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 357, 361-363, The Macmillan Company, New York, 1966.

Beinke, Randall E. and Williams, Jerry K. *Driving Simulator*, paper presented at General Motors Automotive Safety Seminar, July 1966.

Briggs, G.E. "Driving as a Skilled Performance," *Driver Behavior*, pp. 123-143, from Proceedings of the Second Annual Traffic Safety Research Symposium of the Automobile Insurance Industry, Northbrook, Illinois, March 1968.

Crossman, E.R., Szostak, H., and Cess, T.L. *Steering Performance of Automobile Drivers in Real and Contact–Analog Simulated Tasks*, Paper presented at 10th Annual Human Factors Society Meeting, October 1966.

Highway Users Federation for Safety and Mobility. *The Driving Simulator Method–Fixed Base Simulators for Group Instruction in Driver and Traffic Safety Education*, pp. 5-6, 10-13, Washington D.C., April 1970.

"How Fatigue Degrades Your Driving Skill," *Research Trends*, pp. 61-63, Autumn, 1971.

SUPPLEMENTARY REFERENCES *(Continued)*

Kaywood, Richard, "Driving Simulators: Plus Factor in Adult Driver Education," *Concepts/for Traffic Safety*, pp. 10-13, Spring 1969, AEtna Life and Casualty Company.

McKnight, A. James. "Needed-Goals for Driver Education," *Concepts/For Traffic Safety*, vol. 4, no. 2, 1971, pp. 2-4, AEtna Life and Casualty Company.

Moore, R.L. "Experience With a Point Light Simulator: The Effects of Alcohol in Low Doses," *Proceedings, National Conference on Driving Simulation*, February 1961, pp. 111-119. Edited by Charles H. Hartman, Santa Monica, California, 1961.

National Research Council. "Engineering and Psychological Uses of a Driving Simulator," *Bulletin No. 261*, 1960, pp. 14-37, Highway Research Board.

Rhum, Gordon J. and Woodcock, Bertram L. *The Effectiveness of the AEtna Drivotrainer in Driver Education*, Iowa State Teachers College, Cedar Falls, 1959.

Ridder, Charles. "Teacher or Projectionist?" *California Journal of Traffic Safety Education*, vol. XVII, no. 4, pp. 24, 31, June 1970.

Seals, Thomas A. *An Evaluation of Selected Driver and Traffic Safety Education Courses*, Florida State University, Tallahassee, 1966.

Stack, Herbert J., "A Resume and Evaluation of Research on the Teaching Effectiveness of Simulated Driving Experiences and Conventional Driver Education Methods," *Traffic Safety Research Review*, vol. 3, no. 4, pp. 12-14, December 1959.

DRIVING RANGES

Driving ranges are little used by professional driving schools in the United States at the present time. The geographical dispersion of students and the cost of land appear to be the primary reasons. However, the professional instructor should be familiar with driving ranges.

The student should know the characteristics, advantages, and limitations of various types of driving ranges

Technically, and the term will be used this way in the Guide, any off-street area constitutes a "driving range." Driving ranges date back to the beginning of driver instruction. Ranges employed in early driver education, and still used by most schools today, are simply paved areas, often parking lots upon which the student may learn to control the car without interference from general traffic. Painted markings, traffic cones, or barricades are used to impose specific maneuvering tasks upon the driver.

In the most simple type of range, the instructor rides with the student to provide the instruction. Since only one student can be taught at a time (by the individual instructor), these ranges are generally called "single car" ranges. More sophisticated ranges allowing simultaneous instruction of several students and ranges that permit instruction in complex emergency maneuvers will also be described in this section.

Advantages and Limitations of Ranges

The range is used primarily to teach beginning students how to control the motion of the automobile, that is, acceleration, stopping, turning, and backing. With the use of painted lines or traffic cones to simulate the outlines of streets, students may also be taught the somewhat more complicated maneuvers involved in negotiating curves, intersections, lane changes, and parking.

The primary advantage of the driving range is that it permits the instructor to remove the distracting effects of complex roadway configurations, traffic control devices, and other vehicles during the initial phases of instruction, thereby (1) allowing the student to concentrate on learning basic control skills, (2) overcoming a certain amount of anxiety created by the presence of other traffic, and (3) reducing the actual probability of an accident to some degree.

The primary limitation of driving ranges is economic. The feeling is that the same teaching functions may be carried out on little used streets with far less cost. Certainly if no usable area is readily available, the cost of procuring and paving a suitable facility will be prohibitive for most driving schools. Where ranges have been created, they have generally occupied facilities developed for other purposes but made available at little or no cost.

The Multiple Car Driving Range

The student should know the nature of the multiple car driving range.

Since the multiple car driving range was first used at a high school in Chicago, in 1936, it has been heralded by specialists in the field of driver education and traffic safety. This method of teaching certain phases of driver education reduces the teacher-student ratio while providing beginning drivers with the opportunity to develop basic and emergency driving skills and to communicate effectively with other drivers. Since most driving school instruction is administered on an individual basis, the use of ranges would for the most part, be confined to public school, fleet operator or other group programs.

The multiple car method permits several beginning drivers to operate automobiles simultaneously on an off-street driving facility (driving range) under the direction and guidance of one or more instructors stationed at specific positions on the range. Instructors normally direct drivers by means of a car radio system, although other communications equipment, such as bullhorns, megaphones, and public address systems, can be used.

The number of cars used at one time on the facility depends on the school itself, on funds available, size of the range facility, activities to be conducted, number of instructors available for supervising instruction, as well as other factors. Some multiple car programs may utilize as few as four automobiles while others may use as many as 12 to 15.

The feature of the multiple car method is an off-street driving area or range, designed and marked to simulate on-road driving conditions and situations. Engineering features commonly found on driving ranges include hills, curves, multilane roadways, two-lane roadways, dead-end streets, regular intersections, T-intersections, off-set intersections, and angle and parallel parking areas. Pavement markings, signs, and signals present in the actual driving environment are also a part of the range layout.

Accident Potential

The use of a multiple car driving range has not indicated an accident potential, and this may be due to the fact that the beginning driver accepts his responsibility with a cautious attitude. He knows he must act in a responsible manner since his safety and the safety of others depend upon his actions.

Factors which may contribute to a low accident rate on the driving range include:

> Properly oriented drivers who are aware of the scheduled activities and know what is expected of them.
>
> An efficient communications system.
>
> A competent, responsible, and well-prepared instructor supervising driving range activities.
>
> A well maintained driving facility.

Advantages of the Multiple Car Method

The multiple car method allows each driver to progress at his own rate without affecting the progress of other drivers. It allows the instructor to give special attention to drivers having difficulty, without disrupting the entire class.

Because there is no other traffic on a driving range, and because the instructor is able to control the range's environment, student drivers can practice basic and emergency driving skills and procedures with minimal liability risks to themselves and the public.

The multiple car method is also cost effective. Costs are reduced because several drivers at the same time can practice maneuvers under the direction and guidance of one instructor.

Limitations of the Multiple Car Method

The multiple car method is not without limitations. Although the method over a period of time is cost effective, the initial costs for land and for the driving range and construction of the facility are high. The acquisition and housing of a number of cars can also be expensive.

In addition, the driving range cannot simulate or provide experience in driving in normal traffic conditions. The absence of these conditions may result in a reduced appreciation for surveillance activities.

Because several drivers may be under the direction of a single instructor, the instructor will be unable to recognize and correct individual errors immediately. This limitation is not a factor during on-street instruction when a driver can receive immediate feedback because his every move is being observed by the instructor.

Emergency Driving Range

The student should know the characteristics and applications of driving ranges used for instruction in emergency procedures.

The primary use of driving ranges in the past has been to provide instruction in basic vehicle control to beginning students. In recent years, range techniques have also been applied to a different set of driving tasks, those concerned with emergency maneuvers. An "emergency," as the term has been employed in this connection, refers to a situation that presents an imminent danger to the driver. In order to be incorporated into training, "emergencies" must obviously be simulated. A number of ingenious techniques have been devised to create synthetic emergency situations in driving ranges.

The most extensive program of research and development in the area of emergency driving ranges has been that taking place at the General Motors Proving Ground. Most of the emergency ranges being used for instructional purposes at the present time have utilized, at least in part, techniques developed at the General Motors range.

The type of emergencies simulated on driving ranges include those described below.

Evasive Maneuvers. A great many of the collisions that drivers have with other vehicles, cyclists, or various obstacles, could have been avoided or ameliorated had the driver been able to execute the appropriate evasive maneuver. Two general types of evasive maneuvers have been dealt with on emergency ranges.

If it is possible to steer around an obstacle without braking, it is most desirable to do so since application of the brake tends to lock wheels reducing the driver's ability to steer. Instruction in this type of evasive maneuver has been provided by having the driver approach a barricade at the end of a lane which has been marked by pavement markings or traffic cones. The barricade may be avoided by either a right or left turn. To simulate emergency conditions, the driver is not informed until the last possible moment which "escape" route to take. He therefore learns to control the motion of the vehicle during a sudden evasive maneuver and to avoid using his brake. The driver generally approaches the barricade initially at slow speeds and gradually works up to higher speeds.

Some emergency situations both require and permit the driver to reduce speed before undertaking an evasive maneuver. While speed reduction may be desirable in lessening the probability or consequences of a crash, it complicates the evasive maneuver by requiring the driver to exercise controlled braking. To simulate this emergency situation, the driver generally approaches a barricade which he is instructed to steer around. At some distance prior to reaching the barricade, he is allowed to apply the brakes in a controlled manner so as to minimize the speed at which he drives around the barricade.

Off-Road Recovery. It is not unusual to encounter a roadway with shoulders so poorly constructed or maintained that they are several inches below the level of the pavement. If a driver intentionally or inadvertently allows his right wheels to leave the pavement, his attempts to steer back onto the roadway are resisted by the effect of the pavement edge against the wheel. If the wheels are turned far enough to mount the pavement, they may cause the car to veer into an opposing lane of traffic before the unprepared driver manages to countersteer. A driving range can provide a section of pavement which is elevated above the surrounding area to provide a student experience in regaining the roadway while countersteering quickly enough to remain in his own lane.

Tire Blowouts. While blowouts are encountered infrequently in vehicles with sound tires, the tires on vehicles operated by young drivers are often in poor condition. A device has been developed which allows an instructor to simulate a blowout by causing a tire to be deflated suddenly through the wheel rim, thus affording the student a chance to gain experience in bringing the car to a safe, slow stop following a blowout. The device automatically reinflates the tire so that repeated practice may be provided.

Skid Control. Almost half of highway accidents involve skidding to some extent. Generally, the more slippery the surface, the more likely is skidding to contribute to a collision. In many cases the driver could have avoided a collision had he controlled the vehicle in such a way as to prevent skidding. To provide students experience in handling cars during a skid, many ranges provide a "skid pad," that is, an area of the range in which the pavement has been made slippery by the application of some substance; water is generally sufficient. The student approaches the slippery area at moderate speed. As he reaches it, the brakes are applied momentarily by the instructor to introduce a skid, if possible by some device other than the brake in order to avoid "cueing" the student as to when the skid is to be initiated. The student is provided practice in the steering and control braking required to bring the car to a stop in a straight line.

Other emergencies. There are a variety of other emergencies that may be simulated on a driving range. Foremost among these are the following:

> Power steering failure—as the student approaches a turn, the engine is cut off causing a loss of power steering, a frequent occurrence as cars stall when slowing to make a turn. The student learns to react by applying greater force to the steering wheel.
>
> Brake failure. A reduction in brake fluid causes a loss of brake pressure. The student learns to respond by pumping the brake pedal, using the parking brake, downshifting, or turning away from trouble as the situation dictates.
>
> Sticky accelerator–The accelerator is prevented from rising as the student releases it. The student must react by placing the car in neutral, turning off the engine (if there is no wheel lock), and applying the brakes quickly.
>
> Blinding lights–As the student reaches a portion of the range at night, a set of high beams is turned on. The student learns to avoid retaliating and to keep his eyes focused along the right edge of the roadway.

BASIC REFERENCES

American Automobile Association. *Teaching Driver and Traffic Safety Education*, pp. 233-235, 238-239.

Automobile Safety Foundation. *The Multiple-Car Method: Exploring Its Use in Driver and Traffic Safety Education*, pp. 3-6, 26.

Nolan, Robert L. *The Off-Street Multiple-Car Plan*, Highway Traffic Safety Center, Michigan State University, East Lansing.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 198-200.

Brody, Leon and Stack, Herbert J. *Highway Safety and Education*, pp. 292-294.

Quane, W. Laurance, "The Changing Range," *Journal of Traffic Safety Education*, p. 19, vol. XVIII, no. 4, June 1971.

Quane, W. Laurance, *Utilizing the Multiple Car Driving Range*, Illinois State University, June 1971.

Quane, W. Laurance, *Students on the Multiple Car Driving Range*, Illinois State University, June 1971.

Quane, Roger P. *Emergency Driving Skills: Course Outline*. Maryland Police Training Commission, Pikesville, Maryland, June 1972.

Smithson, F.D. *"Approved" Driver Education Course*, paper presented at the Institute for Road Safety Transportation Symposium on psychological aspects in driver behavior, August 1971.

ON-STREET INSTRUCTION

The great volume of professional driving instruction is administered on the public streets. As an instructional setting the street comes closest to approximating the ultimate driving environment. However, any street in any city is only an approximation to the driver's ultimate environment. It is indeed a form of simulation. Like other forms of simulation—mechanical simulators and ranges—the street environment may be continued so as to present specific situations desired. Early in instruction it is set up so as to invoke a little traffic and as simple roadway configurations as possible. Later, a more complex on-street environment is selected.

Like the classroom, simulator and range, the street environment should be viewed as an instructional environment having its own special advantages and limitations.

Nature of On-Street Instruction

The student should know the nature of on-street instruction.

On-street instruction teaches the student driver to apply in real world traffic situations the knowledge he has acquired during classroom, simulation, laboratory, and/or driving range instruction. This instructional method allows the student driver, accompanied by the instructor, to practice driving procedures, skills, and maneuvers and to make judgments and decisions under actual driving conditions.

The student driver has full control of the car during instruction, although the instructor can limit within seconds, the amount of control, if necessary, by utilizing the driver education car's dual control instruments. (Dual controls may include a second brake and clutch located on the instructor's side in a manual shift car, and a second brake and an instructor's engine cutoff switch in an automatic transmission car. A few professional driving schools also utilize vehicles equipped with dual control steering wheels.)

Objectives of On-Street Instruction

The student should know the objectives of on-street Instruction.

Development of Motor Skills

The beginning driver will initially learn the basic motor skills (those skills for controlling the speed and direction of the car) while driving at slow speeds on the driving range or in a little travelled, on-street area. He refines these skills during later on-street instruction when he can practice at normal and high speeds such skills as steering control, braking, lane changing, and passing in the real driving environment.

On-street instruction facilitates motor skill development because conditions and situations requisite to such development are present on the roadways. The fundamentals of lane changing, for example, can be learned on the driving range. However, application of those fundamental skills at greater speeds and under normal traffic conditions is possible only during on-street instruction.

Development of Perceptual Skills

Many of the driver's motor skills are closely associated with perceptual judgments he makes. Again using lane changing as an example, the driver must decide whether it is safe to enter the adjacent lane before he actually attempts to alter the direction of the car. While some traffic conflict is possible on a driving range, it does not adequately reflect what actually occurs in the real environment. As a result, perceptual skill development on the driving range is limited. On-street instruction, however, provides an environment in which perceptual skills can be developed. These skills, associated with the rapidly changing relationship between the car and the environment, include the judgment of distances for passing, following, and stopping distances, curvature of the road, and speed of vehicles.

Development of Habits

Driving behaviors require considerable practice before they become habits. Some habits—fastening safety belts or signaling for turns or lane changes, for example—can be developed on a driving range. Those more perceptual in nature, however, are more readily developed in a simulator or during on-street instruction. The beginning driver develops many procedures—surveillance procedures, for example—into routine perceptual habits. Looking well down the roadway instead of directly in front of the car; scanning the side of the roadway; using the rearview mirrors frequently; checking in all directions when approaching intersections; watching for children—all begin to develop into perceptual habits during on-street instruction. They are refined as the driver acquires experience in operating the car.

Summary

On-street instruction helps the beginning driver to develop both his motor skills and his perceptual skills and to acquire perceptual habits which enable him to operate a car more safely and efficiently. More than any other method, on-street instruction prepares him to operate and manipulate the car's controls in response to normal traffic conditions and to a variety of roadway designs and configurations.

Relationship of On-Street Instruction to Other Methods

The student should know the relationship of on-street instruction to knowledge, procedures, and skills developed by other instructional methods.

To Classroom Instruction

In-car and especially on-street instruction time should not be wasted on instructional content that can be covered in the classroom. Indeed, classroom instruction prepares the beginning driver for behind-the-wheel instruction. (See "Classroom Instruction" in this Instructor Guide.) In the classroom, the new driver receives information related to procedures as well as information describing procedures. This information is enabling knowledge. It enables a student driver to engage in learning experiences during in-car instruction with a reasonable degree of success.

To Range Instruction

Roadway configuration, traffic signals, other drivers, and other factors tend to create distractions which the beginning driver is unable to handle until he has acquired some behind-the-wheel experience. Actual in-car experience can start on the driving range, an environment that minimizes such distractions while offering a feeling of security to the new driver yet permits him to operate the car himself.

On the range the student driver can learn and practice basic driving procedures under controlled conditions. When he is able to exercise a reasonable amount of control over the car, he can continue learning and practicing in the real environment during on-street instruction.

To Simulator Instruction

The simulation laboratory should prepare drivers for in-car instruction. Prior to driving on the street the beginning driver should have some knowledge of what to expect in the real driving environment. To be sure, the classroom and driving range can provide him with knowledge of this nature. However, the simulation laboratory not only presents this knowledge, but it also provides the means for the driver to apply knowledge in a no-risk environment, before he actually drives on the street.

Simulator instruction provides the beginning driver with realistic scenes of the driving environment, then requires him to make appropriate responses. In responding, the driver becomes aware of the potential hazards in the real environment and can practice certain procedures that will become habits (e.g., scanning, signaling, etc.).

The "closed loop" nature of modern driving simulators (see section on simulation) do place limitations on the amount of motor skill development that is possible. However, considerable progress on the development of perceptual skills can be achieved through simulation.

Methodological Approaches

The student should know the methodological approaches that are commonly used during on-street instruction.

On-street instruction can be divided into three basic components, each of which is needed to teach the beginning driver how to drive safely and efficiently. These components are lesson orientation, instructor demonstration, and practice driving.

However, before the instructor begins on-street instruction, he must select the practice driving route. With the specific lesson objectives in mind, he selects the route that will offer the beginning driver experiences and conditions to help develop specific motor and perceptual skills.

When selecting the route, the instructor should keep in mind that learning is facilitated when it proceeds from the simple to the complex. On-street instruction should begin in areas that are lightly trafficked but, nonetheless, present conditions and situations where the new driver can learn specific procedures, skills, and principles. Residential streets, uncongested parking lots, and park roads can be utilized at this stage. As the driver progresses in his training, the instructor selects more complex environments. Progress can be determined by the driver's ability to perceive, interpret, and react correctly to traffic conditions and situations. With continued progress, the student driver should be permitted to practice driving in congested urban areas and on expressways.

In selecting the practice routes that will provide conditions for achieving specific lesson objectives, the instructor must consider the following characteristics and features.

Roadway features and configuration (e.g., hills, curves, intersections, ramps).

Traffic signs, signals, and regulations.

Traffic conditions (e.g., volume, patterns of movement).

Pedestrian traffic.

Practice routes should be selected prior to the daily lesson, not after the practice session has begun. The instructor must be thoroughly familiar with the selected route so that he can be prepared for each daily sequence of instruction without having to take instructional time to plan the procedures, skills, and concepts to be emphasized on the roadway ahead.

Orientation

The initial part of each on-street lesson should be an orientation period, during which the instructor should:

Explain the lesson objective(s).

Identify the procedures, skills, and/or maneuvers to be practiced.

Describe in some detail how to perform a specific maneuver, procedure, and/or skill.

Relate the procedures, skills, and/or maneuvers to safety.

Describe what is expected of the beginning driver during the lesson.

Explain specific rules or regulations for the practice driving period.

Answer questions.

The orientation should be comprehensive but brief. To keep it as brief as possible, the instructor can prepare driver guides and distribute them to student drivers at the beginning of the first lesson or prior to each individual lesson. Drivers can familiarize themselves ahead of time with the procedures to be followed. If possible, the instructor's comments should be rendered before entering the car or reaching the practice area so that they don't infringe upon the on-street instruction time.

Practice Driving

During this segment of instruction, the beginning driver practices various procedures, maneuvers, and skills under the supervision of the instructor and learns to recognize environmental cues and thus to make correct judgments and decisions.

In facilitating the acquisition of driving skills during on-street instruction, the instructor should:

Progress from the simple to the complex.

Provide clear, concise, and well-timed directions.

Provide verbal cues and reminders when necessary.

Utilize the commentary driving technique for certain segments of instruction.

Provide the driver with some indication of how well he is doing.

Manually assist the driver when necessary.

Each of these methodological aspects is discussed in the following paragraphs.

Progressing from the Simple to the Complex

When teaching the beginner how to drive, the instructor must adhere to the basic learning principle of progressing from the simple to the complex. Use of this principle accomplishes several important purposes.

(1) It limits the amount of detailed or complex material presented to the driver during his initial learning experiences, thus enabling the beginner to absorb what is being taught without becoming overly apprehensive, frustrated, or confused.

(2) It helps the beginner driver develop confidence because he is more likely to respond correctly when presented initially with basic material than when inundated with complex procedures, maneuvers, and skills.

(3) It develops a foundation of requisite procedures, maneuvers, skills, knowledge, and appropriate attitudes on which the more complex instructional material depends.

An example of the application of the "simple to complex" learning principle in driving instruction is: teaching a driver the location of the control instruments and the functions of each, before teaching him how to start the engine or use the accelerator, brake, or clutch.

The principle can be applied to the learning of other procedures as well. For example, a beginning driver should learn to negotiate intersections in residential areas before being confronted by the urban intersection with its density of vehicular and pedestrian traffic.

Providing Directions

The effectiveness of instruction depends largely on the instructor's ability to give clear, concise, well-timed directions. Vague, lengthy, complicated directions confuse the beginning driver and waste time. To provide meaningful and comprehensible directions, the instructor must plan ahead. He must know the driving route and he must know in advance of the lesson what procedures, maneuvers, and skills he will teach along the route. He should inform the driver at the beginning of the lesson, if possible, of the route to be taken and the maneuvers planned.

Providing Verbal Cues

Verbal cues help the beginning driver perform a maneuver correctly while he is performing it. They should be used infrequently—only to prevent the driver from performing a procedure, maneuver, or skill incorrectly. Instructor cues to a driver having difficulty making a U-turn might include the following: "Check traffic to the rear"; "Check traffic to the front again"; "Begin turning"; "Accelerate slightly"; "Begin recovery."

Like directions, verbal cues must be clear, concise, and well-timed. The frequency of their use will vary with the driver's ability. They are effective when the instructor introduces a complex driving skill or the first few times a new driver operates a car in a relatively congested area. If the instructor overuses verbal cues, the new driver may become overly dependent on the instructor, and his development as a driver may be impeded.

Commentary Driving

Commentary driving is an instructional technique for teaching beginning drivers the importance of surveillance activities and the procedures for scanning the driving environment. This technique requires the new driver to comment on what he sees as he drives. Short phrases are used to identify obstacles, potential hazards, and traffic controls. Examples of the phrases a driver might use are: "Intersection ahead"; "Car ahead"; "Stop sign ahead"; "Pedestrian crossing"; "Clear ahead."

Commentary driving is advantageous to both driver and instructor. It indicates to the instructor what the student driver sees as he drives and how he interprets what he sees. The instructor can then assist the driver in refining his scanning techniques. The technique also forces the driver to concentrate on the driving environment.

There are some limiting factors to commentary driving. Since the technique is used early in the new driver's experiences, it may be difficult for him simultaneously to verbalize what he sees and to control the car. Some new drivers may become so involved in describing what they see they fail to make the appropriate motor responses, make the responses too late, or neglect several aspects of the driving environment. The instructor should assist the student driver with the commentary if the driver fails to identify critical features of the environment. For example, the instructor should say "pothole ahead" if the driver fails to comment.

Following are some points for the instructor to keep in mind when he uses the commentary method:

Agree beforehand on the types of observations the driver is to report.

Have the driver use simple, descriptive phrases.

Refrain from utilizing the technique to the extent that the driver is looking for too many things.

Emphasize the need to recognize potential hazards well before reaching them.

Restrict the commentary driving method to initial training in scanning and observation techniques. Commentary driving for one or two lessons is generally sufficient for most beginning drivers.

Providing Feedback

The beginning driver will make many errors during the learning process. Some of these he will be able to recognize easily because of physical sensations he receives when committing the error. For example, if the driver applies the brake too abruptly the car will not stop smoothly. The jerky stop should indicate to him that he has done something wrong. However, even though the error is obvious, the instructor should identify it for the driver and indicate how to avoid it.

Other errors may go unnoticed unless identified by the instructor. For example, when changing lanes the driver may check his side mirror but forget to check his blind spot. If the driver fails to notice this error, the instructor should point it out to him.

Information (feedback) provided to the driver on his performance should be immediate and precise. Long, detailed explanations should be avoided in favor of simple, descriptive phrases such as "too fast," or "turn too wide." There will be occasions when feedback must be delayed to enable the driver to concentrate on other elements of his performance. But whenever possible, feedback should be immediate.

Situations will be encountered in which a beginning driver commits several errors in the process of executing a maneuver. In such instances it is often best for the instructor to identify only one or two of the more critical errors rather than all of them. This allows the driver to work at eliminating those one or two errors first, then later the other errors.

Whenever possible, the instructor should indicate how a specific error can be corrected. In situations where the instructor tells the student driver that he failed to check the blind spot, the corrective action is obvious. However, not all situations are that simple. A wide turn, for example, may be the result of several factors—driving too fast, turning the steering wheel too slowly, and so on. A brief explanation on the cause of the error facilitates the learning process.

Manually Assisting Driver

In the process of teaching a neophyte driver a specific procedure, maneuver, or skill, the instructor may find it necessary to manually assist the driver, perhaps by guiding the steering wheel or applying the dual control brake. For example, when concentrating solely on speed control during the initial stages of driver training, the instructor may assume the steering responsibilities to enable the driver to direct all of his attention to maintaining a specific rate of speed.

The instructor should provide manual assistance as infrequently as possible to avoid driver overdependence. This is particularly true with respect to the use of the dual control brake.

Summary

The preceding discussion has identified some of the more common teaching methods for on-street instruction. Other methods exist and are no doubt used with success. The instructor should select instructional techniques on the basis of what must be taught, the amount of available instructional time, and student driver differences.

Lesson Plan Development

HOW TO DEVELOP A LESSON PLAN

Most behind-the-wheel instruction is relatively "unstructured"—that is, it is not administered according to a specific preconceived plan. Since this form of instruction is the dominant one within professional driving schools, little written guidance is generally prepared.

However, more and more professional driving schools are offering classroom instruction. Here it is both possible and desirable to prepare written guidance in the form of lesson plans. Where programs are sponsored by a government or private agency, preparation of a written lesson plan may be a requirement.

The student should know how to develop a lesson plan.

The purpose of a lesson plan is to help the instructor present his instructional material effectively. While format will vary, the components of a lesson plan are generally the same. They include (1) a statement of the purpose of the lesson or unit, (2) a list of instructional objectives, (3) a list of applicable instructional aids, materials, and supplies, and (4) the body of the lesson plan. The latter often takes the form of a topic outline of the instructor's planned presentation and will include (1) guidance for presentation and use of instructional aids, and (2) a method for assessing student attainment of instructional objectives.

Lesson or Unit Purpose

The unit or lesson purpose, which should be the first item of the lesson plan, is a general statement of what the instructor plans to teach to the class during the allotted time. An estimate of this time frame should also be stated.

Instructional Objectives

The instructional objectives for the lesson plan indicate the specific goals to be achieved. A synopsis of the lesson, they provide a framework around which the instructor can develop a well-organized outline of the lesson plan.

To aid him in the identification and development of instructional objectives, the instructor should know what resource materials are available and be familiar with them. A current resource is the driver education task analysis conducted for the National Highway Traffic Safety Administration (NHTSA) which identifies instructional objectives for more than 70 driving tasks. This material, together with a number of driver education textbooks, provides the instructor with a good selection of resource materials.

Instructional objectives must state clearly and concisely what each class member is expected to achieve during the time allotted for the lesson plan. Such publications as Stating Behavioral Objectives, by Gronlund, and Preparing Instructional Objectives, by Mager, will help the instructor develop skill in writing instructional objectives.

Materials and Supplies

The lesson plan should include a list of the materials and supplies the instructor will need for an effective presentation: audio-visual equipment, films, filmstrips, slides, chalkboards, models, mock-ups, flashlight pointer, handouts, traffic situation display boards, and a variety of literature. The list should appear near the beginning of the plan, directly before or after the instructional objectives. Placement here will permit the instructor to determine quickly what items he will need without having to look through each page of the lesson plan.

Selection of materials and supplies for specific topic areas is discussed elsewhere in this Instructor Guide.

Body of the Lesson Plan

The body of the lesson plan is an outline of the instructor's lesson plan, together with instructional methods and aids and evaluation techniques.

Topic Outline

A topic outline is an overview of the instructional material, arranged in a logical manner so that the instructor can use it as a point of reference in the presentation of the lesson. The major headings of the topic outline should reflect the instructional objectives stated at the beginning of the lesson plan. Subheads under major headings are a point-by-point identification of the items and concepts the instructor plans to present to his class. It is not a complete script of the lesson; it is an outline of the lesson.

Sources the instructor can use for developing a topic outline include textbooks, state driving manuals, articles in periodicals and professional journals, and research papers.

Instructional Methods and Aids

Instructional methods and aids can save the instructor a great deal of time, freeing him of the necessity of committing to memory the details of his instructional strategy.

The format for indicating instructional methods and aids in the lesson plan may vary. For example, the topic outline itself may appear on one half of the page and the concomitant instructional methods and aids on the opposite half page. Or this information can be included in the outline but, for attention and emphasis, underscored, capitalized, or "boxed."

Student Assessment

The primary means for determining whether the class is responding to the instructor's presentation is to observe class members as they operate a car on the street and/or the driving range. Here they can demonstrate procedures and skills and apply the principles and concepts they have been taught. Some procedural practice is also possible in the simulator laboratory. A cue in the lesson plan can indicate when an evaluation activity is required. Available rating forms can be listed.

A secondary method for evaluating beginning drivers is through tests and/or assignments administered at appropriate points in the lesson.

Format for evaluation activities may be the same as that for the instructional methods and aids.

Summary

The lesson plan outline is a reference for the instructor as he presents his material. It should include (1) a statement of the purpose of the lesson, (2) a list of instructional objectives, (3) a list of materials and supplies needed for the presentation of the lesson, and (4) an outline description of instruction and class activities.

SAMPLE LESSON PLAN OUTLINE

Unit Purpose: To teach prospective driver education instructors the backing maneuver and to prepare them for teaching the maneuver to beginning drivers.

Estimated Classroom Time: ______________ **Laboratory Time:** ________________

Instructional Objectives

Upon completion of this unit:

I. The student should know the nature and importance of the backing maneuver.

II. The student should know the procedures, as well as laws and regulations, pertaining to the backing maneuver.

III. The student should know the skills required for backing a car safely.

IV. The student should be able to perform the backing maneuver correctly.

V. The student should know how to teach beginning drivers how to back a car safely.

VI. The student should be able to demonstrate his ability to instruct beginning drivers in the backing maneuver.

VII. The student should know the instructional aids, materials, and supplies available for enhancing instruction in the backing maneuver.

Materials and Supplies

- Copies of list of instructional objectives.
- Materials from this Instructor Guide's Backing Maneuver section
    - Copies of "Driving Task Requirements," including "Skills."
    - Copies of "Resource Materials."
    - Copies of "Instructional Aids."
- Text material from page 20 of The Drivers Guide, North American Professional Driver Education Assn.
- Materials from National Safety Council
    - Copies of Accident Facts.
    - "Better Backing" slides.
    - Copies of safety briefs, "Backing Rite" and "Better Backing."
    - Sample safety pamphlets.
    - Directory of Safety Films and Allied Visual Aids.
- Materials from AEtna Life and Casualty Co.
    - Teacher's Manual for AEtna Drivotrainer.
    - Simulator film "Backing Safely."
- Allstate Insurance Company's simulator film "Special Maneuvers."
- American Automobile Association's Driver Education Publications.
- Transparency illustration of placement of equipment on driving range.
- Copies of multiple car driving range plans.
- Copies of sample rating forms for evaluating student drivers–e.g., Automotive Safety Foundation's Multiple Car Method or University of Maryland's Laboratory Chains of Procedures and Evaluation Checklist.
- Chalkboard.
- Slide projector.
- "Object" to place in path of car for teaching correct body position.
- Display table.

SAMPLE LESSON PLAN OUTLINE
(Backing Maneuver)

Instructional Aid: Copies of List of Instructional Objectives.

I. Nature and Importance of Backing Maneuver

A. Driving tasks requiring backing maneuver
1. Entering and leaving parking spaces
2. Y-turns
3. Maneuvering into or out of driveway or garage

B. Basic skills required
1. Speed control
2. Steering control

C. Hazardous aspects
1. An unexpected maneuver
a. Pedestrians and other drivers do not expect car to move against normal traffic pattern
2. Improper or unsafe backing
a. Detrimental to traffic flow
b. Threat to property and individuals in driving environment
(1) Statistical data on backing accidents are misleading because many backing accidents are minor and not reported
(a) Source for statistical data—National Safety Council's Accident Facts

Instructional Aid: Copies (or Display) of Accident Facts.

(2) Accident sites—parking spaces, parking lots

II. Procedures for Backing

Instructional Aid: National Safety Council's "Better Backing"—30 2x2 Slides.

Copies of "Driving Task Requirements" and "Skills" for Backing from Instructor Guide.

A. Laws and regulations pertaining to backing
1. Circumstances prohibiting/preventing maneuver
a. On freeways
b. If an impedance to traffic or right of way
c. If in violation of the law

B. Body positions
1. Correct positions
a. For backing car in straight line or turning to right while backing, body faces right side of car, head is turned to look out rear window.
b. For turning left while backing, body faces left side of car, head is turned to look over left shoulder

2. Positions/actions to be avoided
    a. Putting head out left window is dangerous, restricts driver's view directly behind car
    b. Opening left door to look back creates danger of bodily injury and/or property damage

C. Surveillance before and during backing maneuver
  1. Of traffic and road conditions to the rear
      a. Must be checked constantly to avoid endangering pedestrians, other vehicles. Neither expects car to be moving against traffic flow
  2. Of blind spots
  3. Along intended path.
      a. Must be clear and expected to remain clear before backing maneuver is begun

D. Steering control procedures
  1. Positioning of hands
      a. At top of steering wheel for greatest control with least effort
  2. Directional control
      a. Wheel should be turned in direction rear end of car is to move
      b. Steering should be gradual to avoid loss of control from oversteering

E. Speed control procedures
  1. Speed should be slow to prevent loss of control
  2. In manual shift car, clutch is used to control speed
  3. In automatic shift car, brake is used to control speed

F. Stopping procedures
  1. Greater pressure must be applied to brake pedal
  2. Greater stopping distance must be allowed because brakes are less efficient when car is in reverse gear

III. Skills Required

Instructional Aid: Continued Use of "Better Backing" Slides

A. Ability to control speed
  1. Factors determining safe speed
      a. Traffic conditions
      b. Presence of pedestrians, other potential hazards to the rear
  2. Methods of controlling rate of speed
      a. Coordinating use of steering wheel with accelerator pedal while looking to rear
      b. In manual shift car, depressing and releasing clutch
      c. In automatic shift car, depressing and releasing brake

IV. Practical Instruction for Teaching Candidates

A. Purpose of instruction
  1. To ensure ability of teaching candidate to back car in a straight line and to turn car in either direction while backing

B. Demonstration of maneuver
  1. Driver's position
  2. Surveillance procedures

3. Speed control
4. Steering (directional) control
5. Stopping

C. Assessment of teaching candidate's ability to back car
1. Body positions (See IIB)
a. For backing on straight path and/or to right
b. For backing to left
c. Hazardous body positions
(1) Dependence on rearview mirror
2. Surveillance procedures before and during backing (See II C)
a. For pedestrians, traffic, and road conditions to rear
b. For blind spots
c. Along intended path
3. Steering control (See II D)
a. Position of hands
b. Direction and extent of wheel movement
(1) Oversteering
4. Speed control (See II E)
a. Use of clutch in manual shift car
b. Use of brake in automatic shift car
5. Stopping (See II F)
a. Timing braking procedure
b. Amount of pressure on brake

V. Instructing Teaching Candidates in How to Teach Safe Backing to New Drivers

A. Instructional methods
1. Methodological sequence
a. Classroom
b. Simulation
c. Behind the wheel
(1) Range
(2) Off-street
(3) On-street
2. Purpose of sequence
a. To permit instructor to transmit knowledge and content information in the classroom and simulator laboratories before conducting practical exercises on range and street

B. Classroom instruction
1. Content and enabling knowledge
a. Importance of backing maneuver (See I)
b. Backing task requirements (See II and III)
2. Techniques
a. Development of lesson plans: lectures/discussion (from material in I, II, and III)
b. Utilization of handouts/pamphlets

Instructional Aids: "Backing Rite" and "Better Backing," Safety Briefs Available from National Safety Council

Sample Safety Pamphlet for Beginning Drivers

c. Selection and use of films, slides, and other resource materials

Instructional Aid: Copies of "Resource Materials" for Backing from Instructor Guide.

d. Sources, assignment, and discussion of additional reading

Instructional Aid: Teacher's Manual for AEtna Drivotrainer System (for Ideas on Practice Drills)

2. Simulator films

Instructional Aids: "Backing Safely"—AEtna: "Special Maneuvers"—Allstate.

Chalkboard for Listing Film Presentation Techniques

   a. Presentation techniques
      (1) Stopping films for emphasis, class discussion
      (2) Rerunning segments for emphasis, discussion
3. Homemade slides
   a. Purpose—to illustrate such features of the backing maneuver as body positions, hazards in environment, surveillance
4. Films, filmstrips, and slides
   a. Considerations in selection
      (1) Applicability
      (2) Length
   b. Methods of selection
      (1) Instructor review
      (2) Synopses in film directories

Instructional Aids: Display of Directories of Films and Instructional Aids Available: e.g., National Safety Council's Directory of Safety Films and Allied Visual Aids: AAA's Driver Education Publications.

Copies of "Instructional Aids" for Backing from Instructor Guide.

D. Behind-the-wheel instruction
   1. Purpose—to provide additional practice in and/or development of perceptual skills for estimating distance, procedures and skills such as steering, speed control, surveillance
   2. Prerequisites
      a. Simulator laboratory drills in over-the-shoulder viewing and steering to familiarize beginning drivers with techniques required
   3. Orientation
      a. Lesson objectives
      b. Rules and regulations—e.g., maximum speed for practice exercises
      c. Practice areas
   4. Demonstration of backing maneuver
      a. Time—after completion of orientation and before BTW practice
      b. Place—on driving range or off-street area
      c. Techniques to be demonstrated
         (1) Body positions (See II B)

Instructional Aid to be used with Beginning Drivers: An Object in Pathway of Car Which Cannot be Seen if Driver does not Assume Correct Body Position, or Relies on Car Mirrors During Backing Maneuver.

- (2) Surveillance (See II C)
  - (a) Traffic and road conditions, blind spots, intended path before and during backing should be checked and comments made on favorable and unfavorable conditions
- (3) Steering control (See II D)
  - (a) Directional control should be maintained during demonstrations and comments made on correct placement of hands, direction and extent of steering wheel movement
- (4) Speed control (See II E)
  - (a) Slow speed should be maintained and comments made on use of clutch to control speed in manual shift car, and brake in automatic shift cars
- (5) Stopping (See II F)
  - (a) Gradual stop; emphasis on need for greater pressure on brake pedal when stopping in reverse

5. Practice areas
   - a. Before in-traffic instruction
     - (1) Driving range on T-exercise, X-exercise, and circular or figure 8 areas
     - (2) School parking lot or other off-street area when range is not available
   - b. During in-traffic instruction
     - (1) Lightly-traveled street and off-street areas
6. Driver practice
   - a. Time—following instructor demonstration of driving maneuver (See VI D4)
   - b. Methods/Procedures to be followed
     - (1) Cones, stanchions, flags, other equipment in place before lesson begins

Instructional Aid: Chalkboard or Transparency Illustration of Placement of Equipment for Backing Exercise on Driving Range

- (2) For practice in backing in a straight line
  - (a) Cars aligned 10-15 feet apart, side by side, across width of range or off-street area
  - (b) End of practice area (50 feet deep) marked by flags
  - (c) Beginning drivers repeat practice several times
- (3) For practice in backing in a turn
  - (a) Cars aligned in a column on range or long stretch of roadway
  - (b) Drivers, singly, practice backing in straight line and around corner
- (4) For practice in specific areas on range
  - (a) T-exercise area—for teaching backing in a straight line, estimating distance from an object, and handling car in tight space
  - (b) X-exercise area—for teaching turning while backing as well as skills taught on T-exercise area
  - (c) Figure 8 or circular area—for teaching speed and steering control while backing

Instructional Aid: *Copies of Multiple Car Driving Range Plans; Discussion of Multiple Car Techniques and Use of Different Exercise Areas*

- c. Instructor's station
    - (1) On driving range—at point where all activity can be observed; specific exercise or perimeter of range at one of the corners where practice takes place
    - (2) During on-street instruction—seated in driver education car
- d. Specific points of instruction/learning problems to be anticipated
    - (1) Body position
        - (a) Learning problem—failure to turn far enough to be able to look look through rear window
    - (2) Surveillance of traffic and road conditions
        - (a) Learning problem—failure to check in all directions
    - (3) Backing in a straight line
        - (a) Learning problems
            - [1] Difficulty in controlling speed because of incorrect use of clutch (manual shift car) or brake (automatic shift car)
            - [2] Difficulty in maintaining directional control because of turning steering wheel too much or in wrong direction, and improper positioning of hands
        - (b) Driver practice; verbal cues gradually withdrawn
    - (4) Turning while backing
        - (a) Learning problems
            - [1] Failure to check position of front of car in relation to turning path
            - [2] Difficulty in coordinating speed and steering while backing around a corner
            - [3] Backing too fast
        - (b) Driver practice—backing to right and to left
    - (5) Stopping
        - (a) Learning problems
            - [1] Stopping too abruptly
            - [2] Failure to stop at designated spot
            - [3] Inadequate amount of brake pressure

E. Evaluation of driving performance

- 1. Techniques for evaluation
    - a. Observing student driver
    - b. Rating forms geared to predetermined standard of manipulative skill

Instructional Aid: *Copies of Sample Rating Forms for Discussion—e.g., Automotive Safety Foundation's Multiple Car Method (pp. 38-39); U. of Md.'s Laboratory Chains of Procedures and Evaluation Check List*

F. Methods for correcting unsatisfactory performance

- 1. Analyzing errors
- 2. Informing driver of errors
- 3. Indicating to driver the causes of errors and how to correct them

VI. Evaluating Teaching Candidates During Their Practice Teaching

- A. Practice teaching in the classroom
  - 1. Organization of material
    - a. Relevancy to backing maneuver
    - b. Sequence of presentation
  - 2. Use of instructional aids (chalkboard, visual aids, pamphlets)
  - 3. Conduct of classroom discussions
  - 4. Ability to answer questions

- B. Practice teaching in the simulator laboratory
  - 1. Orientation presentation before film
  - 2. Conduct of demonstrations
    - a. Over-the-shoulder viewing and hazard detection procedures when backing in a straight line and when turning while backing
    - b. Steering techniques when backing in a straight line and when turning while backing
  - 3. Conduct of class drills
    - a. Over-the-shoulder viewing
    - b. Steering techniques
  - 4. Presentation of films, filmstrips, and slides
    - a. Selection of material
    - b. Ability to clarify questioned segments
    - c. Ability to discuss film content and relate it to other driving experiences
  - 5. Instruction of beginning drivers
    - a. Providing directions
    - b. Identifying driver errors
    - c. Assisting drivers in correcting their errors/problems

- C. Practice teaching on the driving range
  - 1. Preparation of range
  - 2. Orientation
  - 3. Demonstration of techniques associated with backing
    - a. Over-the-shoulder surveillance
    - b. Hazard detection
    - c. Steering control
    - d. Speed control
    - f. Perceptual skills
  - 4. Instruction of beginning drivers
    - a. Providing directions to drivers
    - b. Selection of observation point
    - c. Identifying errors/learning problems of beginning drivers
    - d. Assisting drivers with problems

- D. Practice teaching on on-street areas
  - 1. Ability to give directions on activities/procedures to be followed
  - 2. Ability to demonstrate backing maneuver
  - 3. Ability to instruct driver during practice
    - a. Using verbal cues
    - b. Identifying errors/learning problems
    - c. Assisting driver with problems
    - d. Responsive to hazardous situations

Proficiency Evaluation

The student should know the purposes and techniques of proficiency evaluation in driver education.

The processes dealt with thus far have concerned the means by which students are led to the attainment of instructional objectives. No curriculum is complete without a system for evaluating the extent to which instructional objectives have indeed been attained.

GOALS OF PROFICIENCY EVALUATION

The Proficiency evaluation process should accomplish the following:

- Determine whether students have met course objectives.
- Identify specific student deficiencies relative to instructional objectives.
- Identify specific curriculum deficiencies relative to instructional objectives.

The first goal is that of evaluating the student's readiness to enter the highway transportation system. To the extent that the instructional objectives of the curriculum reflect the needs of the highway transportation system, an evaluation of student readiness may be based upon these objectives. While the completion of driver education is a legal prerequisite to the issuance of a license, i.e., certification, the evaluation process serves as a form of "quality control" over curriculum development and the administrative process. Unfortunately, many driver educators do not choose to exercise this quality control, preferring to leave that function to licensing agencies. While one may debate the merits and liabilities of actually involving the driver educator in the licensing process (see Page I-6) there is no justification in an instructor's passing or issuing a certificate to a student whom he has not evaluated and found to be qualified.

The second goal of proficiency evaluation is diagnostic. Its purpose is not to assure overall quality but to identify and orient the instructional process to specific student needs. This form of proficiency evaluation should begin early in the administration of the curriculum and continue throughout. Since its purpose is basically instructional, it may utilize methods that are less formal, less objective, and less systematic than those required for quality control. The standards may be made more flexible in that students may be permitted to advance within the course in spite of certain diagnosed deficiencies. This practice will allow even those who ultimately fail the course to receive a maximum amount of instruction, an important provision since most of these individuals will ultimately obtain a license by one means or another.

The third goal is also diagnostic. However, here the purpose is to identify deficiencies within the curriculum rather than with the student. The function of the curriculum is not simply to provide information but to enable students to attain instructional objectives. Consistent failure on the part of students to attain certain objectives points to some deficiency in the course. Any evaluation system should provide a check on the production processes as well as upon the products. The information gained from evaluation of student proficiency constitutes an important input to the refinement of the curriculum and the manner in which it is administered.

TYPES OF PROFICIENCY MEASURES

The ultimate objective of the driver education curriculum is improvement in driver performance. The performance objectives of the curriculum become the target of both the instructional and evaluative processes. However, performance objectives relate to the driver's "real world" driving performance, and this performance is difficult to evaluate. While reported accidents, observed violations, or self-assessments are useful as indices of driving performance, they suffer the following disadvantages:

- Their validity as measures of overall driver performance is questionable.

- A long period of time is required to collect such data.
- They do not point to specific driver deficiencies.

All that the driver education instructor can hope to evaluate is the student's attainment of the knowledges, skills, attitudes, and habits which will lead to improved driving performance. A variety of measures has been used to evaluate attainment of these enabling objectives. These include (1) written tests, (2) simulator tests, (3) range tests, and (4) road tests.

Written Tests

Written tests are most useful in assessing the student's attainment of knowledge objectives. Tests typically consist of a set of questions calling for the student to recall specific items of information. (Both questions and responses can be presented orally, although it is generally impractical to do so except in the case of students with reading difficulties.) In order for knowledge tests to provide a valid evaluation of student proficiency, they must meet the following conditions:

1. The questions should be a representative sample of the specific items of information that constitute knowledge objectives.
2. The index of proficiency must weight individual items in terms of the criticality of the performance to which they relate.
3. Questions must be constructed in such a way as to be capable of being answered by anyone possessing the required information, that is, they must not depend upon knowledges or skills that are irrelevant to the curriculum.
4. The questions must be constructed so that students not possessing the required information will have only a chance probability of answering correctly, that is, the question must not cue the student to the correct answer.

A written test of knowledge can only assess the student's possession of information; it cannot determine whether he is able to apply the information or whether he will remember to do so in the absence of the reminder provided by the question itself. However, because of the efficiency with which written tests can assess possession of information, they should constitute the primary, if not exclusive, method by which attainment of knowledge objectives is assessed.

Written tests have also been used to assess students' attitudes. The most popular attitude measure presents a statement of opinion or belief to which the student responds by indicating his acceptance or rejection. The validity of that type of measure is directly proportional to the student's candor in responding to it. Even when nothing is at stake, one may be skeptical about the student's willingness to reveal his true feelings. Where the test will be used for evaluative purposes it is highly likely that the students will be strongly influenced by what they believe the instructor wishes them to say.

A variety of subtle, indirect approaches to the assessment of attitudes has been attempted, many employing rather complex psychological instruments such as "projective" tests. To our knowledge, none is sufficiently valid or easily administered to utilize in educational programs.

Simulation Tests

On the whole, simulators (of the motion picture variety) may be used for assessing attainment of those objectives for which simulator instruction is appropriately directed. These objectives include the following:

1. Ability to recall and apply information required by specific tasks.
2. Ability to perceive a variety of complex highway and traffic patterns.
3. Ability to apply appropriate initial responses to various emergency situations.
4. Various traffic habits, particularly those concerned with visual surveillance.

While simulation is limited with respect to the skills, habits and knowledge applications it is capable of assessing, it does have the advantage of being able to standardize the situations to which students will respond and record readily the nature and timing of student responses.

Range Tests

The primary advantage of a range in the assessment of student proficiency is its ability to measure the student's operation of the car where variations in traffic and roadway conditions are tightly controlled. The control of these conditions is particularly valuable in assessment of the following:

1. Fundamental vehicle control skills uncomplicated by the influence of traffic conditions.
2. Ability to apply normal driving procedures under specific roadway and traffic conditions.
3. Ability to apply procedures involving adverse roadway conditions.
4. Ability to handle various roadway, traffic, and vehicle-related emergencies without danger to the student or other drivers.

Road Tests

The highway affords the most comprehensive possible assessment of student attainment relative to instructional objectives. Types of objectives for which road tests are suited include the following:

1. Ability to recall at appropriate times and to apply information required in dealing with highway, traffic, and environmental conditions.
2. Perceptual skills involved in time/distance estimation and identification of potential hazards.
3. Manipulative skills involved in fundamental car control and in handling a variety of roadway and traffic conditions.

The presence of the test administrator in the car will encourage the student to devote conscious attention to responses, making difficult the assessment of normal driving habits. This can be countered to some extent by making the period of observation sufficiently long so that the student "adapts" to the presence of the examiner and by "overloading" or distracting the student to prevent his applying conscious attention at points where habitual responses would be expected to occur.

One objection to the use of the roadway in assessing student proficiency is the lack of "standardization" inherent in the normal driving environment. The fact that no two drivers will be confronted by the same constellation of situations makes inter-student comparison inequitable, particularly for overall student evaluation. In this regard, a number of factors should be considered. First, a major goal of proficiency evaluation is to obtain a representative sample of knowledges and skills (and to a lesser extent, attitudes and habits). To limit situations to those that can be readily standardized lessens representativeness of the sample. Secondly, if the number of situations is large enough, the sufficiently reliable estimate of the student's total population of skills and knowledges will be generated to permit equitable inter-student comparisons. Finally, a major purpose of proficiency evaluation is to guide instruction in meeting specific student needs. This purpose can only be met through an evaluation system capable of sampling a broad range of objectives.

DEVELOPMENT OF PROFICIENCY EVALUATION MEASURES

At the present time, a variety of proficiency evaluation measures is available, including written, simulated, range, and road tests. However, none of these is capable of assessing proficiency relative to the instructional objectives that characterize a particular driver education course. The objectives of student proficiency evaluation can only be met through tests prepared by individual instructors to sample the knowledges, skills, attitudes, and habits that constitute objectives for their own courses. An examination of existing tests may help guide the instructor in his selection of a general approach and provide many specific test items that are relevant to his course.

The largest single source of written test items is that compiled by the Highway Safety Research Institute of the University of Michigan (Berger and McDole, 1971). Of written attitude measures, the most widely used is that developed by Siebrecht in 1954. Simulation tests are included in the film programs of both of the major motion picture simulators and are available to driver educators whose courses involve simulation.

At the present time there does not appear to exist any formal, standardized range test. However, the McGlade road test, developed in 1961, deals with many of the fundamental control skills and routine driving procedures for which range instruction is frequently provided. The lack of range tests covering more complex skills reflects the infrequency with which range instruction in these skills has been given. As this type of instruction becomes more widespread, formalized test procedures relating to such skills may be expected.

As just noted, the best-known road test, that of McGlade, deals primarily with relatively routine tasks. A test capable of exploiting a large variety of situations that characterize the on-road environment awaits development. One of the more ambitious efforts in this regard is that taken by the Michigan State University (Forbes et al., 1971). The objective of this effort was to develop a test that could assess the student's ability to deal with the complexities of highway and traffic in a smooth, skilled performance. At the time this Guide goes to press, the final report on the MSU project is unavailable.

Despite the assistance the driver educator may obtain from the above sources, his ability to develop a sound proficiency evaluation program is dependent upon his own ability to generate questions and situations that represent fairly the objectives of his own course. Approached systematically, the task is not a difficult one.

Written knowledge test items should meet the conditions mentioned earlier, they should sample knowledge objectives broadly, ask only for information that is required, and phrase questions in a manner that will allow students possessing the information to answer the questions correctly. Because of the ease with which they are administered and scored, multiple choice tests are the most popular form of written examination. In preparing multiple choice test items, the following requirements should be generally observed:

1. All alternatives should deal with the same information.
2. Each item should be independent of all other items, neither requiring nor furnishing information used in another item.
3. Questions should be simply worded and written in a clear, unambiguous manner (and no "trick" questions).
4. Wording of the questions should not provide clues to the correct answer.
5. Incorrect answers should be similar to correct answers in wording, level of difficulty, and length.
6. The questions and alternatives should be as concise as possible.
7. One set of alternatives should not automatically eliminate another as being correct.
8. Alternatives should be in random order except where numerical or logical sequence is involved.
9. "None of the above" or "All of the above" should not be used as correct or incorrect answers.
10. Graphic representations (e.g., figures and diagrams) should be used when, and only when, they are necessary for clarification.
11. Use of negatives should be avoided if possible. When use is unavoidable, the negative term should be emphasized.
12. Items should be arranged so that it is unnecessary to refer to more than one page at a time.

Attitude measures should call for simple statements of belief. The most popular type of items sets forth an opinion and calls for the respondent to indicate his degree of agreement or disagreement. This confounds the nature of the belief with the intensity of feeling, something that the instructor may not care to do if his purpose is merely to identify attitudes.

In an effort to obtain more indices of attitude than are possible with straightforward opinion items, many instructors have introduced attitude items into written knowledge tests, disguising the items to appear as factual. Since there is no truly correct answer, the student is forced to select that which he believes is correct. It is hypothesized that his desire to be correct will outweigh his tendency to select a "desirable" answer. The aptitude items would, of course, be scored separately.

The development of a road test involves primarily (1) the selection of a route that will permit a broad range of observation to be made and (2) the selection of appropriate observations. The typical road test will be divided into two 25-30 minute segments, one for each of two students. If the second segment largely backtracks the first, each student will encounter the same general driving environments.

All observations that are to be made should be selected in advance and recorded on an instructor check list. Unless the observations are preselected, the risk is great that the instructor will tend to observe and record student errors more than correct responses since they are more noticeable. Because each student encounters a different set of situations, his "score" must include the relationship between errors and correct answers, rather than either statistic alone.

A truly comprehensive road test must include observations of student response to events that cannot be planned in advance, e.g., traffic conditions, traffic lights, pedestrians, and car problems. Although the situations themselves cannot be planned, the instructor should select those points at which they are most likely to arise. For example, he would look for the student's reaction to a car suddenly pulling out from the curb at a point where such is most likely to occur–for example, alongside 30-minute parking meters. Similarly, he would look for the student's response to an uncancelled turn signal where a very gradual turn has been made. Unless the instructor's attention is specifically directed toward these contingent observations, he is very likely to miss them when they arise.

The instructor should limit himself to three or four observations at any one point, recognizing the need to devote attention to the student's safety, recording responses, and giving directions. Both the nature and timing of any directions to students should be established in advance.

Many performance tests score student responses in degrees of "goodness." This not only allows instructor bias to creep into the scoring but fails to identify specific student strengths and weaknesses. Until the Michigan State University effort described earlier succeeds in providing a workable system for scoring complex patterns of responses, it would be desirable to reduce behaviors to specific components which do or do not occur, or to tolerance limits that are maintained or exceeded.

VALIDITY AND RELIABILITY

Many professional instructors have been discouraged from attempting to develop a formal proficiency evaluation program through concern for the validity and reliability of their measures. Unfortunately, their concept of these characteristics has often been inappropriate.

Validity refers to the extent to which a test actually does what it purports to do. If a test is supposed to measure student attainment of an identifiable set of performance capabilities, knowledges, or skills, it is necessary only that the test provide a representative sampling of those characteristics. This form of validity is called "content" validity. It is not necessary that the test correlate with some index of subsequent performance such as accident record unless the test is intended specifically as an accident predictor. Correlations between measures of knowledges and skills on the one hand and accidents on the other are generally very low. This is not because knowledges and skills are not important for safe driving but, rather, because students must acquire a certain level of knowledge and skill before they are allowed to drive. An analogy may be found in tests of visual acuity. Because individuals with poor vision are not allowed to drive, the correlation between measures of acuity and accident record is extremely low. However, one would not conclude from this that tests of visual acuity are "invalid."

The term "reliability" arose from the field of psychometrics, in which tests were used to measure basic human characteristics such as "aptitudes" or "traits." The characteristics the tests measured were purely hypothetical variables; they had no existence independent of the tests themselves. The only way to determine whether the tests were measuring anything at all was to compare repeated measures of the hypothetical variables to see whether they agreed. These measures might be different test items, different halves of the test, or administration of the entire test on different occasions. If the various measures correlated with one another, it could be reasoned that they were measuring the same basic characteristic.

Measurement of hypothetical variables has little to do with samplings from known population performances, knowledges, beliefs, etc. It is quite possible for an individual to know the answer to one question and not another. In any case, correlations among various parts of the test cast no reflection upon the test's reliability as a measure of student attainment. Certainly no attempt should be made to eliminate items showing low part-whole correlations, as to do so would lessen the representativeness of the item sample.

BASIC REFERENCES

Berger, Wallace G., McDole, Thomas L. and Pollock, William T. *A Handbook for Driver License Knowledge Testing, Part II - Test Item Pool,* preliminary report, Highway Safety Research Institute, The University of Michigan, Ann Arbor, October 25, 1971.

Forbes, T.W. et al. *Research on Driver Performance Measurement Phase I—Method Development and Pilot Study,* Michigan State University, East Lansing, September 1971. Report FH 11-7627-2.

McGlade, F.S. *A New Road Test,* Center for Safety Education, New York University, 1961.

Siebrecht, E.B. *Driver Attitudes—Techniques of Study and Results Obtained,* Iowa State College, Driving Research Laboratory, Cedar Falls, Iowa, 1954.

D

Curriculum Administration

A curriculum is an educational recipe. It describes what the end product of instruction is to be, the ingredients that are required to produce the product, and the means by which the ingredients must be combined. However, as a recipe, a curriculum is incapable of accomplishing anything without the efforts of people. A curriculum will lead to effective learning only in the hands of a competent teacher who is capable of translating its provisions into a set of instructional activities. These activities consist of more than interactions with students. Curriculum administration, at least as it is treated in this Guide, encompasses all functions that are required to assure that effective interaction takes place. These functions include:

> ***Planning and Procurement***—Identifying and obtaining the resources needed to support instruction.
>
> ***Instruction***—Managing the classroom, laboratory, and related out-of-school experiences of students.
>
> ***Program Administration***—Meeting requirements needed to conform with school, district, and state policy.
>
> ***Conduct of Special Programs***—including driver improvement, instruction of handicapped students, and community relations.

Planning and Procurement

Before instruction begins, the requirements for personnel and materials must be identified and fulfilled. This section will consider the following aspects of the planning and procurement function

Determination of Instructor Requirements

Selection of Training Devices and Facilities

Planning and Designing Range Facility

Planning a Simulator facility

DETERMINATION OF INSTRUCTOR REQUIREMENTS

> **The student should know how to determine the numbers of instructors needed to administer a developed driver education curriculum.**

The most critical single ingredient of a driver education course, like any other course, is the instructor. The qualifications of a competent driver educator were discussed in an earlier section and need not be reviewed here. Effective curriculum planning involves those activities needed to make sure that instructors possessing the required qualifications are engaged in adequate numbers to meet the needs of the curriculum.

Most professional driving instruction involves a one-to-one student instructor ratio. Here, personnel planning is a matter of assuring that there are enough instructors for present and anticipated commitments. However, whenever groups of students are to be involved, as in classroom instruction or programs taught under contract to other agencies, the determination of instructor needs becomes more complex.

One of the factors that complicates the determination of instructor requirements is the differing needs of various "phases" of instruction, that is, classroom, simulator, range, and on-street instruction, a particular concern when instruction is to be provided under secondary school programs. The following formula was prepared by the Highway Users Federation for Safety and Mobility (HUFSAM)[1] to assist public school administrators in determining the number of instructional hours required as a function of the amount of class time required in each phase of instruction.

$$\frac{NC}{U_1} + \frac{NS}{U_2} + \frac{NM}{U_2} + \frac{NT}{1} = H$$

The letters used in this formula have the following meanings

H = instructor hours

N = number of students

C = number of classroom hours

S = number of simulator hours

M = number of multiple car range hours

T = number of on-street hours

U_1 = number of students per classroom

U_2 = number of simulator units

U_3 = number of cars on the multiple car range facility

The following examples illustrate the use of this formula.

Example 1 How many instructional hours are needed to teach classroom, simulator, and on-street instruction to 120 students? All students receive 36 hours of classroom instruction, 12 hours of driving simulator instruction, and 4 hours of on-street driving. Assume there are 30 students per class and a total of 12 simulator units.

$$\frac{NC}{U_1} + \frac{NS}{U} + \frac{NT}{1} = H$$

$$\frac{120 \times 36}{30} + \frac{120 \times 12}{12} + \frac{120 \times 4}{1} = H$$

$$144 + 120 + 480 = 744$$

In this example, 744 instructional hours would be required to administer a driver education course meeting the conditions described.

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[1] **Highway Users Federation for Safety and Mobility (HUFSAM).** ***The Driving Simulator Method: Fixed Base Simulators for Group Instruction in Driver and Traffic Safety Education,*** **Washington, D.C. April 1970.**

Example 2 How many instructional hours would be required to teach classroom, driving simulator, multiple-car, and on-street instruction to 120 students? All students would receive 36 hours of classroom instruction, 8 hours of driving simulator instruction, 6 hours of multiple car instruction, and two hours of on-street driving. Again, assume 30 students per class, 12 simulator units, and 8 cars on the range facility.

$$\frac{NC}{U_1} + \frac{NS}{U_2} + \frac{NM}{U_3} + \frac{NT}{1} = H$$

$$\frac{120 \times 36}{30} + \frac{120 \times 8}{12} + \frac{120 \times 6}{8} + \frac{120 \times 2}{1} = H$$

$$144 + 80 + 90 + 240 = 554$$

A total of 544 instructor hours would be required to teach a driver education course meeting the conditions described above.

The total instructional hours required for a particular program during a given semester may be divided by the maximum number of teaching hours permitted under the policy of the driving school. This would furnish a rough estimate of the number of instructors that are required to administer a developed driver education curriculum for a particular class or during a particular term. The estimate is only approximate since it may not be possible to schedule instructors in such a way as to utilize each instructor for the maximum number of available teaching hours. It is not until a detailed schedule of classes and instructor assignments has been worked out that instructional needs can be verified. However, the HUFSAM formula will provide an estimate that is sufficiently accurate for planning purposes.

SELECTION OF TRAINING DEVICES

The student should know how to select those training devices that are most cost effective with respect to instructional objectives.

In developing a curriculum, the driving instructor must make judgments as to what general types of training devices are best suited to the attainment of various knowledge and skill objectives. Before he can begin to teach, however, he must ultimately decide upon the specific devices that will allow him to attain maximum teaching effectiveness at minimum cost.

For the purposes of this discussion, the term "training devices" would include any equipment intended primarily to aid in the conduct of instruction including the following:

Audio-Visual Equipment

Motion pictures and projection equipment

Slide/filmstrip and projection equipment

Slide/filmstrip with audio (e.g., cassettes)

Multimedia equipment

Student response recording equipment

Displays

Traffic models, e.g., magnetic boards

Mock-ups, e.g., dashboard displays

Cut-aways and working models, e.g., engine

Simulators

Open loop simulators, e.g., motion picture simulators

Closed loop simulators, e.g., point light source simulators

Range devices

Communication equipment

Traffic control devices

Barriers

Skid pads

Vehicle accessories

Dual controls

Response recording equipment, e.g., steering reversals

Aids to observation, e.g., special mirrors, video recorder

Task simulators, e.g., blowout simulator, engine stalling device

Special vehicles, e.g., undersized cars

In many cases, the instructor's selection of training devices is limited to the simple task of determining the way in which he may most effectively utilize those devices that are already available within the driving school's inventory or through the agency contracting for instruction. Here the process is a relatively simple one of deciding which devices are most appropriate to the objectives and instructional method of a particular instructional unit. For example, the instructor may decide that he can do a better job of teaching the student how to negotiate intersections properly by using a magnetic traffic board than by using either the particular motion picture film or simulator exercise that he has within his library.

When the instructor is contemplating the purchase of new devices, the selection process is, for several reasons, much more complex. First, instead of being able to base his selection upon previous experience, he must estimate teaching effectiveness from the design characteristics of the device. This is a difficult process. Secondly, with existing devices, the instructor is able to utilize each device in the situation for which it is best suited. However, his selection of new devices may be limited to a single item. Since no one device is superior in all respects, he is required to balance all strengths and weaknesses in one area with those in another. Finally, since devices must be paid for by the driving school, the instructor must estimate costs of different devices and relate them to differences in teaching effectiveness.

Effectiveness of Training Devices

In evaluating the potential effectiveness of a training device, the driver instructor must attend solely to those characteristics of the device that relate to instructional objectives of his course. In doing so he must guard against being overly responsive to such considerations as the following:

Physical appearance. The device is obtained to do a job, not to impress clients, parents, or visiting dignitaries. Once the device is in use, its superficial virtues will become less apparent and the device will serve only to gather dust if it is not capable of being used effectively.

Level of sophistication. Many equipment purchases have been motivated by the purchaser's desire to appear to be "in step with the times." In such cases, instructors forced to spend an inordinate amount of time maintaining and utilizing equipment that is more sophisticated than they need or are prepared to cope with. In a sense they become captives of the equipment that was intended to serve them.

Unnecessary capabilities. Brochures and sales representatives place great emphasis upon what a device "will do." of course the device itself does nothing; it is merely a tool designed to aid the instructor in achieving objectives. Any "capabilities" that do not help the instructor achieve his objectives are without value.

The instructor can best avoid being overly responsive to irrelevant device characteristics by preparing an evaluation plan in advance. The plan would identify those instructional objectives for which a device is being sought and provide a means of estimating effectiveenss of each device relative to each objective. The results may then be accumulated across the objectives of the course in order to determine which device will provide the greatest overall contribution.

In estimating the effectiveness of the training device relative to a particular objective, the driver educator needs to consider the following

Informational capability—The ability of the device to communicate a full range of required information accurately, rapidly, and widely (i.e., to all students).

Task fidelity—The ability of the device to reproduce tasks faithfully enough to assure that appropriate responses are practiced.

Interactional capability—The ability of the device to alter stimuli as a function of the student's response.

Feedback—The ability of the device to communicate the nature or acceptability of the student's response to the student and/or instructor.

Flexibility—The ease with which the nature of information or task may be changed by the instructor as dictated by his instructional approach.

Cost of Training Devices

The overall cost must be estimated for each device being considered. In some cases a procurement will be constrained by a particular funding level, while in other cases it will simply be a matter of "getting the most for the least."

In estimating the cost of a device, the following factors must be considered:

Purchase price—The initial cost of the item including such accessories as spare parts, films, and so on.

Useful life—The estimated period of time the device will last before it needs to be replaced.

Maintenance cost—The cost of keeping the equipment in sound operating condition including instructor servicing, repairs, etc.

Operating cost—The cost of operating the device (per hour, day, week) including the number and salaries of instructors and other personnel required to utilize it effectively.

Facilities cost—The cost associated with the space required to use and/or store the device.

Initially, costing may consist merely of assigning relative values to each of the above cost considerations. Ultimately, however, it will generally be necessary to estimate actual cost and to compute some overall figure such as "cost per student" in order to make precise cost comparisons and to forecast actual expenditures.

AIR Evaluation System

To assist driving instructors in evaluating training devices, Horner and Shettel[1] of the American Institutes for Research have developed the Handbook for the Evaluation of Driver Education Training Devices. While this document focuses entirely upon devices intended to provide practice in vehicle operation—simulators and driving ranges—it furnishes a precise system for estimating the effectiveness and cost of training devices.

The system for evaluating effectiveness requires the instructor to estimate the ability of a particular device to fulfill a specified set of functional requirements relative to each of 27 key vehicle operation tasks. The ratings are then assigned numerical values according to a system of weights which reflects the importance of each functional characteristic to training effectiveness. The weights were derived through a complex process involving the judgment of a panel of prominent driver instructors.

To enable the instructor to incorporate cost considerations in device comparisons, the AIR system provides a method of calculating total device costs. The method includes those costs factors identified earlier.

The AIR evaluation system has been applied to a motion picture simulator and a driving range, each of which was generally representative of the capabilities offered by each type of device. The results are largely in keeping with the discussion of device advantages and disadvantages presented in section IIC—Curriculum Development. These results may be summarized as follows:

1. The driving range is superior in its ability to create the stimulus-response interaction needed to develop manipulative skills and to provide stimuli from the side and rear.
2. The simulator is superior in its ability to provide a variety of stimuli required in the development of perceptual skills, and to provide a means by which the instructor can control stimuli and monitor student responses.
3. Both types of device require improvement in their ability to create a range of driving situations and provide feedback to student and instructor as to the correctness of responses.

PLANNING AND DESIGNING A DRIVING RANGE FACILITY

The student should know the factors to be considered when planning for and designing a driving range facility.

A professional driving school rarely, if ever, gets involved in the planning of range facilities. When range instruction is to be conducted, the school generally utilizes facilities available to the agency sponsoring the instruction. However, the driving instructor should know something of the considerations involved in planning and designing a range facility. For one reason, it will help him to understand the reasons why the range was designed as it was, and thus enable him to exploit its capabilities. Secondly, there is always the possibility that a driving instructor may be called upon by some agency or individual to assist in planning or designing a new range facility.

General Considerations

The general considerations influencing facility design are (1) the ability to provide instruction and practice needed to attain instructional goals, (2) the ability of the instructor to exercise surveillance and control over vehicles on the facility, and (3) the ability to assure the security and safety of students, instructors, and others.

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[1] Horner, W.R. and Shettel, H.H. *Handbook for the Evaluation of Driver Education Training Devices*, American Institutes for Research, Pittsburgh, 1972.

Instructional Considerations

Insofar as instructional considerations are concerned, design characteristics of the range may be divided into three categories: those that are related to basic control skills, those that are related to normal driving procedures, and those that are related to emergency skills.

For providing instruction in basic control skills, all that is generally needed is a set of pavement markings or traffic cones to create control tasks. The most common configurations are the following:

Straight lines for lane keeping, both forward and in reverse.

Curves, serpentines, and figure 8 for control turning.

Intersections for stopping and sharp turns.

Curbside areas for angle, perpendicular and parallel parking.

Slight grades for practicing starts on an incline.

Instruction concerned with procedures for dealing with normal roadside and traffic situations has generally been dealt with on-street. However, some instructors have found the driving range permits them to have some advantage in having the additional control over roadway and traffic situations. By the use of pavement markings to create roadway configurations, together with simultaneous control over several cars to provide traffic situations, instructors are able to provide practice in the performance of the following tasks:

Maintaining proper following distance.

Estimating passing distance and performing the proper passing maneuver.

Angle merges with other traffic.

Negotiating intersections in the presence of oncoming and cross traffic.

While some instructors have gone so far as to provide such structures as traffic control devices, roadway signs, or railroad crossings, the training value of these efforts is debatable in view of the general availability of such structures in on-street driving.

For the most part, an emergency range capable of supporting the types of emergency maneuvers described in the Curriculum Development section, (Part IIC, immediately preceding this section) can be created with but a modest investment in time and funds. First, since evasive maneuvers can be practiced at relatively low speeds, space requirements are minimal. A few acres will suffice. Teaching evasive maneuvers and off-road recovery will require some minor construction or landscaping. However, the same basic facilities used in teaching basic control skills may be utilized. A suitable "skid pan" for teaching skid control can be created merely by wetting a surface that has been prepared with a sealer. A thin layer of water maintained on the surface of the range will create a suitably low coefficient of friction to permit practice in skid control. The water is more economical, cleaner, and more convenient to use than chemicals, ice, and other agents.

Surveillance and Control

To provide effective instruction, the teacher must be in a position to see all that is occurring. Many ranges provide a raised instructor's station—e.g., a permanent "control tower" or a portable stand. It must be high enough and so located as to provide the instructor a commanding view of the entire range, or that portion of it that will be in use at any one time. In a rectangular range, the control position is generally along one edge where it allows the instructor to keep all vehicles within a 180 degree view. The tower should never be placed in the center of the range where critical events could occur behind the instructor's back. A control tower is by no means a necessity and many instructors prefer to be able to move about the range instead of being confined to one location.

The instructor must be able to communicate with all drivers. He can do so with powered megaphone or "bullhorn," but radio communication is superior. While two-way communication has some advantages, it is by no means essential. Some provision should be made to secure the involvement of those students who are not driving at a particular time. At a minimum, these students should be in a position to hear the instructor's communication with drivers. This may be done by placing the students in the car with the driver or by congregating them around a radio provided for the purpose. If the range is to be used for night driving, it should be well illuminated.

Security

If possible, the range should be enclosed by a fence to prevent outsiders from wandering onto the range during instruction and to help prevent theft or damage to property. The fence should be located far enough from the paved area to keep it from becoming a real or mental hazard to novice drivers on the range.

In a permanent range facility, an enclosure should be provided for the storage of traffic cones, barricades, and other range equipment. Vehicles should not be left at the range unless they can be protected by a secure enclosure. If the range is lighted, the chances of theft or vandalism will be reduced by leaving the lights on throughout the night.

Range Equipment

A variety of equipment items is needed to permit effective range instruction. The most important of these is, of course, automobiles. However additional equipment is needed for purposes of traffic control, communication, and facilities maintenance.

Automobiles

The number of automobiles that will be involved in range instruction depends upon (1) size of student enrollment, (2) the size of the range facility, and (3) the number of automobiles that can be obtained. Only when the instructional program has been outlined in detail is it possible to specify the automobile requirements. The actual procurement of automobiles is treated in the next section.

Traffic Control Devices

The instructor will require a variety of devices to create driving tasks for students. Among these devices are the following:

Pavement Markings. Pavement markings used to simulate the edge of the roadway may be configured so as to represent intersections, curves, merge points, parking places, driveways, and so on. They may also be used to represent lane markings to provide instruction in proper lane usage. The advantage of pavement markings is their permanence. However, this is a real advantage only to the extent that the particular configurations lead to effective instruction. For this reason, the instructor should avoid use of permanent pavement markings until he has either gained some experience in range instruction with temporary markings, or obtained design guidance from others with more experience in range instruction.

Traffic Cones. The most popular type of temporary control device is the rubberized or plastic traffic cone. So as to be readily visible, cones are generally painted yellow or orange and are at least 18 inches long. They can be readily arranged by the instructor to create the same configurations as described in the case of permanent markings.

Flags and Poles. Flags and poles have been used in a manner similar to traffic cones. Their principal advantage is their height which makes them useful in teaching precise maneuvers, such as parallel parking, where proximity would make a traffic cone impossible to see. Flags are generally triangular in shape to create less wind resistance and are provided in a variety of colors to which the instructor can give different meanings. The poles should be flexible so as to yield on contact with the car in the event they are accidentally struck.

Barricades. Barricades such as wooden construction "horses" are more readily visible than cones or flags and therefore may be used to close off particular areas. Instruction in evasive maneuvers, such as that described under Curriculum Development (Part IIC), is generally conducted with the use of barricades.

Traffic Control Devices. While many of the larger, "sophisticated" ranges provide traffic control devices such as roadway signs and stop lights, there does not appear to be a great deal to be gained from their use. Most of these devices weigh too much to be considered portable and their use is confined to a permanent facility. In addition, instruction concerned with identification of traffic control devices can be carried out far more economically through classroom or printed aids. Practice in responding to such devices can be provided more economically through on-street instruction.

Communications Equipment. Loudspeakers or bullhorns are not only rather ineffective on windy days, they are also an annoyance to the general public. Radio communications can utilize standard automobile AM or FM receivers. For range use alone, small battery powered transmitters are available for communicating distances over several hundred feet. FM radios need only be turned to approximately 90 megahertz, the band authorized for one-way communications. An AM radio must be converted to a citizen's band receiver. It is also possible to use separate transmitter-receiver systems such as a "walkie-talkie" although such systems are generally less reliable and more expensive in the long run.

Maintenance Equipment. Equipment for performing simple operator maintenance on vehicles should be available. This would include pliers, screwdrivers, wrenches, and jumper cables. Brooms and cleaning equipment should be available for keeping cars neat as well as for policing the range area. Two sets of ignition keys to the cars should be available at all times since it is not unusual for an instructor or student to forget to return the keys he is using.

BASIC REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, The Macmillan Company, New York, 1966.

Automotive Safety Foundation. *The Multiple-Car Method: Exploring Its Use in Driver and Traffic Safety Education*, March 1967.

San Diego County, California. *A Guide to Safety Education, Kindergarten through Grade 12.* Superintendent of Schools, Department of Education, San Diego County, California, December 1969.

Highway Users Federation for Safety and Mobility. *The Driving Simulator Method: Fixed Base Simulators for Group Instruction in Driver and Traffic Safety Education.* Washington, D.C., April 1970.

Horner, W.R. and Shettel, H.H. *Handbook for the Evaluation of Driver Education Training Devices*, American Institutes for Research, Pittsburgh, 1972.

Nolan, Robert O. *Definitions: Multiple-Car Off-Street Driving Range*, Highway Traffic Center, Michigan State University, East Lansing, Michigan, 1964.

Nolan, Robert L. *The Off-Street Multiple Car Plan*, Highway Traffic Safety Center, Michigan State University, East Lansing.

Quane, W. Laurence. "The Changing Range," *Journal of Traffic Safety Education*, p. 19, vol. XVIII, no. 4, June 1971.

Quane, W. Laurence. *Utilizing the Multiple-Car Driving Range*, Industrial Technology/Traffic and Safety Education, Illinois State University, Normal, Illinois, June 1971.

SUPPLEMENTARY REFERENCES

Department of Health Education, University of Maryland. *Health 345 Course Outline*, University of Maryland, College Park, Maryland.

Gray, Walter W. "Utilizing the Multiple-Car Driving Complex," *Journal of Traffic Safety Education*, p. 12, vol. XVIII, no. 4, June 1971.

Highway Traffic Safety Center, Michigan State University, *Instructional Lessons: Multiple-Car Off-Street Driving Range*, East Lansing, Michigan.

PLANNING A SIMULATOR FACILITY

The student should know the factors to be considered when planning for the procurement of a driving simulator facility.

If a simulator is deemed to provide a cost effective method of attaining instructional objectives and procurement of the simulator has been approved by operators of the school, the instructor will often be called upon to take the lead in planning such a facility. Not only is the driver instructor in the best position to relate various simulator characteristics to the overall needs of the curriculum, but he is the only one who knows precisely what characteristics are applicable to the techniques by which the curriculum will be administered. For example, the instructor's decision as to whether to provide immediate feedbacks to students during the course of simulator instruction will have a bearing upon the desirability of procuring a student response display in addition to the printed readout the instructor receives after a simulator exercise has been completed.

To perform his planning function properly, the driver educator must be thoroughly familiar with all characteristics of the simulators under consideration and be able to justify his recommendations to school authorities.

Amount of Equipment

The number of simulator units that will be required depends upon the size of the student enrollment and the number of simulator hours per student. Simulators have been viewed by many secondary school administrators as primarily an economical substitute for in-car instruction, a specified number of simulator hours being roughly equivalent to a specified number of in-car hours. Under such a scheme, the determination of simulator instruction hours is generally set forth under state education standards. However, it has become increasingly clear that simulators are a device unto themselves and that hours spent in the simulator cannot be directly translated to in-car hours. The number of simulator hours will have to be determined by the instructor himself from the requirements of his own curriculum.

Some consideration should be given to future needs at the time simulator equipment is procured. If an increase in simulator instruction hours is anticipated, either through increased use of simulation or greater enrollment, consideration of this fact during initial equipment procurement may reduce the cost of modifying the equipment to accept additional simulator units at a later date.

Classroom Installation

When the space is available, classroom installation of simulators is to be preferred over the use of trailer installations for the following reasons.

The instructor is able to integrate the simulator into classroom instruction more effectively.

The instructor is able to observe students more easily in a typical classroom than in a trailer and to move more freely among them to assist them with problems.

The width of a classroom permits larger screens and more realistic traffic scenes.

The Highway Users Federation for Safety and Mobility (HUFSAM) has set forth the following recommendations relative to classroom simulators.

Students using the simulators in the first row should have a distance of at least the screen's width between them and the screen.

Simulator units should be arranged in a semicircular pattern, if possible, with the viewing angle of the outside unit in each row not exceeding 30 degrees.

Individual "risers" should be placed under simulator units to enable each successive row of students to have an unobstructed view of the screen.

Light switches to darken the room should be within arm's reach of the instructor when he is at the instructor console or at the door. Rheostats have been found to be useful since they allow the instructor to have just enough light to observe the students.

The simulation laboratory should have air conditioning. It provides comfort and enhances the life and efficiency of the instructor console.

Electrical outlets should accommodate three-prong Hubbell plugs and should be supplied with 120 volt, 60 cycle, 15 amp service.

Trailer-Type Installation

When classroom space is unavailable, trailer-type facilities may offer the only means of providing simulator instruction. For the reasons noted above, however, they are inferior to classroom facilities from a purely instructional viewpoint. In theory, the mobility of a trailer facility allows it to be shared by several schools. In truth, the time required to move the trailer from one place to another discourages its frequent relocation and makes it difficult to integrate simulator instruction into the curriculum at any one school.

Planning considerations for this type of simulator facility include:

The electrical requirements: a 220 volt, 100 amp electrical capability with a power source free of fluctuation. The simulator scoring system may not operate properly if the simulator is on the same electrical line as school shops.

The type of surface: level and hard, such as asphalt or concrete.

The location: as close to the school as possible so that students may travel without coats. If the facility cannot be placed close to the school, space within the simulator facility for hanging coats will have to be provided.

Adequate space for storing films and equipment.

Provisions for lighting the exterior if classes are to be taught in the evening.

Provisions for maintaining the facility.

BASIC REFERENCES

American Automobile Association. *Teaching Driver and Traffic Safety Education*, pp. 138-139. McGraw-Hill Book Company, New York, 1965.

Highway Users Federation for Safety and Mobility. *The Driving Simulator Method: Fixed Base Simulators for Group Instruction in Driver and Traffic Safety Education*, pp. 15-20, 22, 23, Washington, D.C., April 1970.

Instruction

This Guide will not attempt to deal with the subject of preparing driver educators to conduct effective instruction. That is the province of teacher preparation in general. This section will deal only with the means by which competent teachers may utilize the methods and devices that have been prepared for driver education. Subjects include classroom aids, simulators, and driving ranges. This section will not deal specifically with on-street instruction. This is not because on-street instruction is unimportant; quite the contrary, it is probably the most powerful instructional tool the driver educator possesses. However, on-street instruction involves little in the way of special techniques or media. It primarily involves structuring, observing, and correcting student performances. Part III of this Guide is almost totally concerned with these performances.

USE OF CLASSROOM AIDS

The student must be able to utilize classroom instructional aids effectively.

A variety of classroom aids is available to assist the instructor in communicating information to students and helping them to develop particular driving skills. These aids include motion picture films, slides, transparencies, models, and mockups. General techniques for the use of such aids are more appropriately covered in a "methods" course than a driving instructor teacher preparation program. This Guide will treat only the particular needs of driving instruction.

Motion Picture Films

Motion picture films not only communicate information about driving, they are capable of simulating to a degree many of the visual aspects of the driver's operating tasks. However, motion picture film should be shown only if the instructor has identified specific requirements for its utilization and is convinced that it is necessary in order to provide an effective and economical learning experience. The film should enhance the learning experiences in the lesson plan.

When he has identified areas in a lesson plan that could benefit from the use of a specific film, the instructor should search a list of films on that topic. If films are available, the instructor should preview as many of them as is practical. While previewing each film he should prepare a synopsis identifying the critical features and noting the time elapsing before each of these features occurs. This not only enables the instructor to evaluate the film fully, but also aids him in the preparation of a revised lesson plan that takes into account the film content. His synopsis can be made available to other instructors who have not previewed and evaluated the film.

An appropriate film should have the following characteristics: (1) It should be directly-related to the objectives of the lesson; (2) it should realistically and convincingly transmit information (outdated films showing old automobiles and modes of dress are not likely to be taken seriously by students); (3) it should be free of major defects in audio and picture quality.

It is not necessary for the entire film to be directly related to the topics in a lesson plan in order for it to be useful. If the preview shows that only a portion of the film is applicable, that portion may be used. If an important segment of the film deals with the topic, the film can be advanced to that segment before the class begins. The instructor should then provide an introduction to that segment and show only that portion of the film.

The film must be an intergral part of the lesson. The instructor should describe it briefly to the students and indicate what his objectives are in showing it. Students should be made to realize they will be held responsible for the film's content or particular portions of it.

In using films that depict roadway scenes as viewed through the windshield, the instructor is creating a type of simulator. While no vehicle controls are present, students may be called upon to indicate their responses—if such is desired—either orally or by the use of electrical responders numbered on colored cards. The instructor may wish to slow, stop or back up and rerun various segments of the film. New projectors are available which permit this to be accomplished without flicker or loss of light intensity. This feature is of particular value for providing practice in hazard detection since it allows the instructor to "freeze" the action at the point where a hazard arises.

Slides, Transparencies and Filmstrips

The use of slides and transparencies in driving instruction does not differ greatly from their use elsewhere. One unique use of these aids is in allowing practice in hazard identification, particularly those hazards that are static in character—that is, hazards that relate to the nature or position of elements in the driving scene rather than their pattern of movement. Examples would be exhaust from a parked car, a pedestrian in the street, a car approaching from the side.

Models

Models of roadway configuration are useful in permitting the instructor to teach, and the students to solve, problems relative to procedures for dealing with various traffic situations. These situations can be developed one stop at a time and students permitted ample time to decide upon approximate responses at each stop.

The most commonly used model is one that may be vertically suspended before the class, the various terrain features being painted on. Movable objects, such as automobiles or pedestrians, are attached by magnets.

Models are extremely useful to instructors who are prepared to utilize them, who interact well with students and can gauge their comprehension as instruction continues. Those instructors who do not handle an interactive role effectively will generally prefer a box of prepared slides or motion pictures. The important point in the use of models is to involve students in the development of the situation itself. Models are the only classroom aid to respond to the students' inputs, the only convenient medium through which students can see the result of their choice of response.

Mock-Ups

Novice students can learn the location of controls and displays through the use of a cockpit mock-up. With a little practice they can acquire the ability to find accelerator, brake and, if appropriate, the clutch, entirely by feel. This will expedite the acquisition of basic control skills during the in-car phase of instruction.

A mock-up need not be elaborate. Some instructors and students have managed to remove the front seat of an automobile and place it in the classroom. However, a wooden facsimile with a painted or photographic dashboard will serve almost as well. What is important is that the device be sufficiently durable to sustain its physical occupation and manipulation by numbers of students.

USE OF THE SIMULATOR LABORATORY

The student should know how to use and care for simulator equipment and other visual aid projection equipment used in the simulator laboratory.

Operation of Simulator Equipment

It is impossible to achieve the instructional goals in the simulator laboratory unless the instructor is thoroughly familiar with the operation of all the simulator equipment. Knowledge of the equipment and the ability to operate it will enhance the chances that material will be presented in a meaningful and efficient manner. It will also enable the instructor to evaluate student progress in the simulator. To achieve these results the instructor must be able to:

Operate the simulator units. Proficiency in using the various controls and instruments located in simulator units is essential since the instructor may have to occasionally provide individual help to students having difficulty. First-hand knowledge of the operation of the unit and interpretation of gauges will be helpful in answering questions.

Operate the projector. The projector is one of the instructor's most important tools in the simulator laboratory. He should become thoroughly familiar with the basic projector operating procedures. Instructors should be able to (1) thread the film into the projector properly so that the film is not damaged; (2) adjust the focus so that the visual scene is sharp; (3) adjust the height of the visual display so that it is properly displayed on the screen; (4) adjust the sound as necessary; (5) adjust the framing knob in the proper direction to eliminate a visual display that is out of frame; (6) stop the film whenever desired by using the "still" button; (7) reverse the film when desired; and (8) rewind the film so that it may be shown at another time.

If the simulator system's projector is not working, a standard 16 mm projector can be substituted, provided it accepts the anamorphic lens. The substituted projector will not be able to read codes programmed into the instructional films, however, the driving simulator projector has a special modification for reading such codes.

Operate the instructor console. The console is essentially a control center where student responses to the simulator film are transmitted, evaluated against desired responses for given situations, and recorded. The instructor must be familiar with the components, operation and timing of the system. He should be able to operate the console in both automatic and manual modes and should be able to identify student errors from print-outs and from the display panel.

Observation of Students

Certain procedures can be checked only by observing the students while they "drive" the simulator in response to one of the programmed films. For example, the use of the hand-over-hand technique while turning cannot be monitored by the simulator scoring system. By walking through the simulator laboratory or by placing himself at an elevated level in the laboratory, the instructor can observe the actions of the class. Students grasping the wheel incorrectly or not using the hand-over-hand technique can be easily identified and corrected.

The instructor may also observe to some extent the timing and quality of student responses. Illumination of the floorboard area of each simulator, for example, enables the instructor to observe whether the student began braking at approximately the correct time and the manner in which he applied the brake. Knowledge of timing and quality of responses in specific situations are also provided through the simulator scoring system.

Monitoring and Evaluating Students Using the Instructor's Console

The instructor's console is essentially a computerized system that provides the instructor with a visual display of student performances. The system also records student responses to coded situations in the film and provides for manual checks of desired responses. When the scoring system is operated in the automatic mode the instructor may circulate throughout the laboratory providing assistance and attention to students requiring it. During this time, student responses are scored automatically. The Allstate System contains either a digital recording device or is equipped with a printer recorder. Both devices total inappropriate student responses. The AEtna simulator system is equipped with a printer recorder for identifying errors made by students.

When scoring is accomplished in the manual mode, the instructor must remain at the instructor's console. He will be required to depress several buttons or selectors in order to monitor student performance on specified tasks.

The AEtna system monitors student performance in eight major categories: (1) starting, (2) shifting, (3) moving, (4) braking, (5) emergency actions, (6) acceleration, (7) right turns, and (8) left turns. The Allstate system monitors student performance in five major areas: (1) steering, (2) braking, (3) signaling, (4) speed, and either (5) acceleration or headlight use.

The instructor must be thoroughly familiar with the scoring system components for the particular simulator system used in his classroom. In order to effectively monitor and evaluate student progress in the simulator laboratory, the instructor must be thoroughly familiar with the films and with the function of each component of the instructor's console or scoring system; know when and how to operate buttons or selectors on the instructor's console to obtain desired information; be able to read and interpret visual displays and printed copies from the recorder printer; know the specific procedures for scoring in automatic and manual modes; provide the students with information on their performance and assist and correct them when necessary.

Maintenance of Simulator Units and Instructor's Console

The instructor should not attempt any technical repairs of the simulator equipment. Generally a service contract with the manufacturer is purchased by the owner to cover technical maintenance and emergency service. If the simulator is leased, the lease contract usually includes the cost of regular maintenance service. The instructor's role in maintaining the simulator units and instructors console are generally limited to activities such as fuse replacement and dust removal. The instructor should, however, maintain a record that lists any problems he has experienced with the equipment. By doing so the regular maintenance man will have some idea of what may be wrong and where to begin.

Maintenance of Film Projectors

The simulator projector as well as other projectors should be maintained on a regular basis. The instructor should regularly clean and oil every projector at least once a year; clean the film gate after classes daily to keep the film from becoming scratched because of dust or dirt; and clean the lens with tissue and lens fluid. Care should be taken not to scratch the lens surface.

Film Care

Regular film care insures a sharp visual display on the screen and extends film life. These guidelines for film care will maintain them in good condition.

Films should be cleaned and treated at least once a year.

After every five to ten screenings, a special cleaning cloth should be used to wipe the film as it rewinds on the projector.

The film should be rewound tightly, but it is advisable not to pull on the end of the film to tighten it, because this causes abrasion marks which cannot be removed.

Films should not be left threaded in the projector for long periods of time since this causes permanent arcs and weak spots.

BASIC REFERENCES

AEtna Life and Casualty in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System*, film sections as follows: "Drivotrainer Installation," and "Scoring Techniques," AEtna Life and Casualty, Driver Education Services, Hartford, Connecticut, 1971.

Allstate Insurance Companies. *Techniques of Simulation: An Instructional Guide to the Effective Use of the Film Strip Series*, pp. 10-25, 29-35. The Driver Education Section, Allstate Insurance Companies, Allstate Plaza, Northbrook, Illinois.

Highway Users Federation for Safety and Mobility. *The Driving Simulator Method: Fixed Base Simulators for Group Instruction in Driver and Traffic Safety Education*, pp. 11-12, 19-20. Washington, D.C., April 1970.

Allstate Insurance Company. *Allstate Good Driver Trainer System*, film booklet "Introduction," Allstate Enterprises Inc., Northbrook, Illinois, 1971.

Quane, Laurance W. *Teacher Preparation in Utilizing Driving Simulators*, Superintendent of Public Instruction, State of Illinois, Springfield, 1972.

Singer Corporation, Link Division. *Link Driving Simulator Maintenance Manual*, LP - 3637, Binghamton, New York, March 1969.

USE OF THE MULTIPLE CAR DRIVING RANGE

The student should know the objectives and procedures for conducting classes on a multiple car driving range.

The functions of the instructor on the multiple car driving range can be categorized into several basic activities:

Preparing the facility for instruction or arranging to have it prepared.

Orienting students on the lesson for the day.

Planning demonstrations of the maneuver(s) or skill(s) to be practiced.

Constructing driving experiences that contribute to the development of driver skill for real life situations.

Directing and guiding the class of beginning drivers through the practice periods, assisting individuals having difficulty.

Determining the amount of practice for any particular maneuver, procedure, or skill.

Dismantling the range or delegating someone else to do so after the day's activities.

Preparation of the Driving Range

Range preparation normally involves the placement of traffic signs, cones, and other equipment that will be used for instructional purposes. The instructor teaching the first lesson of the day must place the equipment in the appropriate places before class begins to avoid having to use instructional time for this purpose. The instructor may assign the range preparation duties to a teaching assistant. A manual for range instructors would be useful also to individuals preparing the range, if it contained diagrams or explanations on equipment placement for specific lessons.

When an instructor has range teaching activities after the facility has been used by other classes, he should check to see that all the equipment he needs for his class is in its proper place. Any necessary changes should be made quickly to avoid misusing instructional time.

Daily Orientation

At the beginning of every range class, the instructor should review the following information for his students:

Specific rules and regulations that pertain to use of the range for the day.

Procedures to be followed.

Key concepts or steps that are an integral part of a maneuver or skill.

Relationship of on-range practice of any maneuver or skill to its utilization in the actual driving environment.

The orientation should be as brief as possible. The primary purpose of the driving range is to permit students to practice vehicle maneuvers. To tie up expensive range facilities and equipment for simple verbal instruction is inefficient.

One way to keep orientation as brief as possible is to distribute driver guides at the beginning of the course or sometime prior to the lesson for the day. The beginning drivers can then become familiar with the procedures to be followed before arriving for the range instruction.

Demonstrations

When teaching motor skills, especially those that are particularly complex, the instructor's initial step is usually to demonstrate the performance. The purpose of a demonstration is to give the beginning driver an appropriate model to follow. Like "daily orientation," demonstrations should be held to a minimum. By describing procedures in advance and using motion pictures to illustrate maneuvers, one or two on-range demonstrations should suffice.

Since the neophyte driver will be practicing at below normal speed, the demonstration should also be given at slow speed. The driver is thus able to make a comparison, irrespective of speed differences, between his own driving and the model of good performance demonstrated by the instructor or teaching assistant. In addition, the beginning driver will make fewer procedural errors if he maintains a below-normal speed.

Demonstrations are most effective when an explanation of the critical elements of the maneuver or skill accompanies the demonstration. The instructor can do the demonstration while the teaching assistant provides the commentary, or vice versa. When an assistant or additional instructor is not available, the orientation session must suffice.

Demonstration of the more complex maneuvers and techniques, such as parallel parking, Y-turns, and passing, should be simplified, with only the most critical aspects of these maneuvers emphasized. Attempting to include every minute component in the demonstration and commentary will confuse the neophyte driver more than it will help him. However, this dubious advantage is outweighed by the assurance, with an instructor or assistant, that the maneuver will be performed properly and quickly.

Generally, a demonstration of any particular maneuver is given once, prior to driver practice on the range. If the instructor observes that several members of the class are having difficulty with a maneuver, he may elect to demonstrate the maneuver again. The demonstration itself can have only a limited effect on the driver's acquisition of the skills involved. The driver's ability to master the driving skills is directly related to the amount and quality of his practice driving.

Constructing Traffic Mix Situations

The purpose for utilizing the multiple car method is that it affords a low risk environment in which many drivers can be trained at one time. However, the question is whether it can be used to provide the type of training necessary for developing the procedures or skills required of the safe driver. To be sure, it cannot be used for developing all requisite procedures and skills, one criticism being that the range does not provide the beginning driver with the conflict situations that occur on the street.

One of the major tasks of the instructor is to provide opportunities for the beginning drivers to experience "simulated" on-street situations. Real life driving involves an interaction with other traffic. Through the efforts of an innovative instructor, the driving range can provide situations similar to those in the actual environment and students should be encouraged to drive in such situations on the range.

The instructor can arrange exercises in which two-way traffic is present; more than one car reaches an intersection at approximately the same time; and drivers are required to merge into and diverge from traffic.

The instructor can contribute much to the learning experiences of neophyte drivers on the range by developing lesson plans which utilize circular range areas for such exercises as merging into and diverging from traffic. He can also develop other traffic mix situations which aid the driver in developing perceptual abilities in addition to motor skills.

While some traffic mix situations can be constructed on the range, certain driving tasks must be learned in the real environment. Some of these include freeway driving, driving on rural roadways, reacting to pedestrian traffic, and handling certain passing situations in traffic.

Directing and Guiding Beginning Drivers

To direct and guide neophyte drivers on a driving range, the instructor must (1) effectively communicate with the drivers in order to facilitate learning and to reduce the accident potential; and (2) position himself on the driving facility so that he can observe all range activity.

Communicating With Drivers

Communicating effectively with the beginning drivers is extremely important. Unless they understand the instructor's directions, the learning process will be hampered. Some guidelines for instructors follow:

> Make certain that the drivers can hear the instructions. Unless a radio system is used on the range, some drivers may be unable to hear all of the instructions. This is particularly true when a bullhorn is used on windy days.
>
> Begin all instructions with specific identity phrases such as "All Cars" or "Car Number X."
>
> Use simple, direct commands that are based on key words. Clear, concise directions do not confuse the drivers and tend to save time.
>
> Give directions well in advance so that the drivers can prepare to execute them. Poorly timed directions tend to confuse drivers, and a confused driver is likely to pay less than an adequate amount of attention to the total driving task, subjecting himself and others to mishap.
>
> Alert drivers to special defensive driving tips and provide precautionary suggestions when necessary.
>
> Use a sincere, encouraging tone of voice when making suggestions or corrections. Never belittle or berate the drivers. Doing so is likely to make them tense, embarrassed, or angry. None of these emotional conditions is conducive to learning.

Instructor Location

Where on a driving range the instructor positions himself when teaching is very important. Ideally, he should be located where he is able to observe any activity that is and/or will be taking place. He will then be able to see possible conflict in time to take preventive measures. Normally, the instructor will have a good view if he positions himself somewhere on the perimeter of the range.

Some facilities are equipped with control towers similar to those found in airports. However, a control tower does not afford the instructor the mobility required to observe vehicle control from different angles.

If a driver is having difficulty with a maneuver, the instructor should attempt to assist him from outside the car. In-car assistance would limit the instructor's ability to observe and communicate with other drivers on the range. Occasionally, however, it may become necessary to ride with a beginning driver. In-car assistance on the range should be given only after the instructor evaluates the problem and feels that it is the most efficient solution to the driver's difficulty.

Determining Amount of Practice

In general, the more opportunity a driver has to practice driving skills, the more likely he will master them. Unfortunately, the instructor is unable to provide an unlimited amount of driving time on the range. This is particularly true when a facility is shared by more than one school or when several classes are scheduled for training on the facility daily.

With scheduling limitations, the instructor must determine how much time should be allocated to specific maneuvers, procedures, and skills. The allocation of time is not easy, particularly when the fact that all drivers will not learn at the same rate must be considered. The instructor must be able to assess the progress of each driver and decide which drivers require more practice and which ones can progress to other aspects of the on-range training programs. For example, the rapid learners can be assigned to review maneuvers previously learned or can be assigned to traffic mix exercises. Slower learners can continue practicing a specific maneuver or skill, provided there is no conflict with the training schedule.

Determining when a driver has mastered a maneuver or skill is difficult. As a guideline, the instructor should permit a driver to continue practicing a maneuver or skill until he has performed it correctly on several successive trials. Successful performance one day, however, does not necessarily mean that the next day or several days later the driver will be able again to perform the maneuver or skill correctly. Providing periodic practice for previously learned skills is the best means of retaining mastery of them.

Dismantling the Range

After the last class of the day has completed its on-range instruction, all equipment must be removed from the range and secured in a safe place. The instructor of the last class and/or his assistant is usually responsible for gathering the portable traffic signs, cones and other equipment that were used. The equipment should be stored in a designated building under lock and key until the next day's activities. In the event the range is located some distance from the school and no building in the vicinity of the range is available for storage, the equipment must be transported back to the school.

All vehicles should be garaged at the end of each day. Many driving facilities have buildings located on them or in the immediate vicinity for garaging the vehicles. Keeping the vehicles behind locked doors is the best means of minimizing the chances of vandalism. If no garage facilities are available, it may be necessary to park all driver training cars on the school grounds. The responsibility for seeing that all vehicles are properly garaged or parked in a designated area ultimately rests with the instructor who last used the vehicles for instruction.

BASIC REFERENCES

Anderson, William G. ***In-Car Instruction: Methods and Content,*** Addison Wesley Publishing Company, Reading, Massachusetts, 1968, pp. 17-20, 23-26.

Automotive Safety Foundation. ***The Multiple Car Method: Exploring its Use in Driver and Traffic Safety Education,*** Automotive Safety Foundation, Washington, D.C., March 1967, pp. 22-23.

Michigan State University. ***Multiple Car Off-Street Driving Range Instructional Lessons,*** Highway Traffic Safety Center, Continuing Education Service, Michigan State University, East Lansing, Michigan.

Quane, W. Laurance. ***Utilizing the Multiple Car Driving Range,*** Industrial Technology/Traffic and Safety Education, Illinois State University, Normal, Illinois, June 1971, pp. 3-40, 45-48, 60-77.

University of Maryland. ***Range Lessons—Traffic Mix Design,*** Department of Health Education, University of Maryland, College Park, Maryland.

Program Administration

There are a number of administrative functions that are too susceptible to school policy to be dealt with in this Guide. These include such items as fee collection, handling cancellations, and scheduling appointments. However, a number of purely administrative requirements that accompany the teaching of a course will be discussed here. These include the following:

Making Initial Contact.

Substituting for Another Instructor.

Insurance and Liability.

Preparing Students for the License Examination.

Record Keeping.

MAKING INITIAL CONTACT

The student should know the appropriate administrative procedures for effective initial contact with new client students.

The instructor's first contact with a prospective student is generally for the purpose of conducting a driving lesson. The purely instructional aspects of the first encounter are dealt with in Part III-Driving Tasks. Here we are concerned with the administrative activities that must take place before instruction may begin. These activities include (1) the introduction, (2) fulfilling legal requirements, and (3) determining instructional needs.

Introduction

Except in the case of classroom instruction, the driving instructor's initial contact with the student will generally occur at the student's residence. The instructor must arrive promptly as scheduled, dressed in a manner that will not only reflect well upon the driving school but inspire confidence in the professional capability of the instructor.

Unless the student is located in the heart of the city where parking is impossible, the instructor should secure his car and go to the student's door, introducing himself by name and the name of the driving school. In the case of a teenage student, the instructor should also ask to meet the parents. Any literature the school provides to secure positive parental involvement may be presented to the parents at this time.

The scope of the initial lesson and the fees for the lessons should be reviewed with the student (and, where appropriate, the parents). While this discussion presumably occurred during the original contact between the student and the driving school, it is worth reviewing in order to avoid any misunderstandings.

Fulfilling Legal Requirements

The student's ability to meet legal prerequisites for vehicle operation should be verified at the outset.

> ***Learners's Permit.*** All states require students to obtain a learner's permit before operating a motor vehicle on the public highway. The instructor should verify that the student has the permit in his or her possession.

Often, the scope of the initial lesson will include a trip to the license examination station to obtain a permit. In such cases the instructor should quiz the student briefly to determine whether the student is qualified to pass the examination. Failing an examination for a learner's permit wastes the time of both the instructor and the student.

Driver Education Certificate. Teenagers (16-18 years) in most states must obtain a driver education certificate before they are allowed to take a license examination. Certification generally requires completion of a specified number of classroom and behind-the-wheel instructional hours (typically 30 and 6 respectively). The instructor should verify that parents and student are aware of all requirements. If the student intends to offer a certificate from another state, the instructor should examine it to make sure that it meets "local" state requirements.

Parent Consent Forms. Teenagers in many states are required to furnish parent consent forms before being allowed to apply for a learner's permit. The instructor should make sure the form has been completed and, where necessary, notarized.

Insurance Waivers. The school's insurance carrier may require students to sign a form absolving the school of liability for certain types of accidents. This is particularly likely if some portion of the instruction is to be administered in the student's own automobile.

Determining Instructional Needs

Before instruction commences, the instructor should determine the student's past driving experience and instructional requirements. For the student who has had some previous driving experience, determining the specific nature of instructional requirements will require some probing.

Students frequently request instruction at a particular level or for a particular maneuver, the most popular example of the latter being parallel parking. The instructor should not attempt to extend or alter the student's request during the initial contact. Since the instructor has had no opportunity to observe the student, he is in no position to evaluate the student's needs. Any attempt to do so may be interpreted as a pure "sales" effort.

During the drive to and from the practice area, the student's overall proficiency may be objectively evaluated and the student provided a straightforward statement of strengths and weaknesses. This may lead to further instruction.

SUBSTITUTING FOR ANOTHER INSTRUCTOR

The student should know how to properly substitute for another instructor.

Occasionally, it may become necessary to instruct students who have had previous lessons with another instructor. A number of factors may necessitate such a situation:

The previous instructor may no longer be employed by the driving school.

The previous instructor may be on vacation, leave of absence, or ill.

The student may have requested another instructor.

The previous instructor's schedule may have made it impossible to instruct the student.

Specific procedures for substituting for another instructor vary from school to school. However, there are several guidelines which substitute instructors should follow. He should:

Whenever possible, determine the reason given to the student for the change in instructors.

Obtain record of the student's previous lessons prior to lesson time to determine how far the student has progressed, the problem areas identified by the previous instructor, and content of this lesson.

Obtain all necessary forms from the office prior to the lesson, if possible.

Introduce himself to the student, explain that the previous instructor is unavailable and that it would be best not to interrupt the training. A student may be hesitant about going with another instructor. If he insists upon having his previous instructor, the substitute instructor should inform the office and another appointment should be arranged. However, students will usually permit another instructor to teach the lesson if the substitute instructor handles the change diplomatically.

Review with the student what has been covered to date. It is generally better to work on something new, unless the previous instructor is no longer employed by the school or will not instruct this particular student again.

Review procedures and related facts if the student is due to take the state license examination. New procedures should not be introduced at this time since it will tend to confuse the student.

INSURANCE AND LIABILITY

A student driver may have an accident during behind-the-wheel training; thus, having the proper insurance protection is important. The responsibility of obtaining insurance that protects the owner, instructor, and other school employees who could be involved, rests with the owner of the school. Ordinarily, insurance programs for the school provide coverage for these individuals and for the students as well. An insurance advisor should be consulted on the types and limits of coverage required.

There have been few court decisions rendered against driving instructors for accidents involving students while they were participating in a driving instruction course. An instructor can be held liable for an accident that occurs during instruction only if he is found to be negligent in carrying out his duties. Generally, the school's insurance program provides the instructor with liability protection. However, he should consult an insurance advisor to determine if the coverage is adequate.

Students enrolled in a professional driving school are generally protected by the school policy when operating the driver education car. Since students who drive the family car for instruction are not covered under the school policy, parents should include their children on the family policy. With appropriate liability coverage, parents will protect themselves against possible suit especially in those states where the parent assumes specific liability upon signing the student learner's permit.

PREPARING STUDENTS FOR LICENSE EXAMINATION

The student should know the procedures to be followed on the day that the client student driver takes the state's driver license examination.

Pre-Examination Procedures

Pre-examination procedures will vary from school to school, and it is imperative that the instructor be familiar with the policy of his own school. The following procedures are rather general to professional driving schools:

An appointment should be made to meet the student at the student's home, office, or at the testing station. The appointment should be scheduled at an hour that will leave sufficient time for the examination to be completed prior to the lunch hour or the end of the day. The instructor does not wish to have his student responsible for inconvenience to the test administrator. In some cases it may be necessary to schedule an appointment with the department of motor vehicles. As much as three weeks lead time may be required.

Upon meeting the student, the instructor should make sure of the following

That the student has a valid learner's permit in his possession.

That teenage students have proof of age and a certificate indicating they have completed classroom instruction.

That sufficient time has passed since the student acquired the permit.

That sufficient time has elapsed since a previous examination was taken (if the student failed).

The instructor should prepare the student for the examination by reviewing (1) procedures that will be used by the license examiner, and (2) important concepts, principles, and traffic regulations.

If the instructor is meeting the student at the test station, the student should be warned to make arrangements for alternative transportation from the test station in the event the examination is failed.

The apprehensive student should be given an opportunity to practice critical or difficult maneuvers prior to the test. While state regulations generally prohibit practice on the test course itself, the instructor can usually find a comparable area near the test site. Practice may include one or two repetitions of the parallel parking maneuver, simulating conditions which prevail in the test (e.g., use of "parking poles").

Upon arriving at the test station, the student should be directed to the appropriate office to initiate the application. The instructor should return to the car and await the student's arrival. Unless he is specifically permitted to do so, the instructor should not place his car in the line for the road test until the student has fulfilled prerequisite requirements.

Post-Examination Procedures

If the student has passed the examination, the instructor should offer his congratulations. Before they part company, the instructor should remind the student of his responsibility to drive safely and exhort him to apply the concepts and principles he has learned during instruction. Finally, the instructor should identify any formalities that are required, following the test, to obtain the license.

If the student has failed, the instructor should provide reassurance. The student should be encouraged to view the results of the exam in a positive sense, as identifying a deficiency that must be overcome. The instructor should avoid attributing failure to "a bad day," ill fortune, or invalid testing procedures. Such an interpretation would undermine his efforts to see that the student obtains further instruction.

The instructor should by all means encourage the student to obtain further instruction, even if the student is unwilling to continue with the present instructor. He should be informed that merely retaking the examination is likely to lead to another failure. While the student might succeed in eliminating his previous errors, he is likely to commit new errors unless his overall proficiency is improved.

Whether or not the student elects to take further instruction, he should be notified of the compulsory waiting period for re-examination.

RECORD KEEPING

The student should know the forms, letters, and records that are his responsibility in the administration of a driver education program and the procedures for developing and preparing them.

Record keeping is a necessary part of a driving instructor's job. The records are used to (1) improve instruction, (2) measure results, (3) record progress, (4) appraise and control costs, (5) record charts and payments, and (6) protect school personnel.

Forms and records, especially those for which the instructor is responsible, should be limited in number and not too detailed, yet they should furnish all the information required. The mechanics of maintenance should not be so complicated that the instructor is inundated with paper work.

Student Record Forms

Student Instruction Record

This form, maintained in duplicate by the instructor on each student, is a record of the amount of time spent in the classroom and on each driving task. Space is provided for the student's grade on each procedure. The form can also be used to indicate the procedures to be omitted for students not taking a full course of instruction.

On the reverse side of the office copy of this form are the following records:

Schedule of lessons with date and payment record.

Survey of areas where practice is needed.

Driver's license road test results.

Instructor's assessment of a student at completion of course.

Drop out informtion.

Referrals from student.

Comments by instructor.

Practice Road Test Sheet

This is a simulated driving test which should be given to the student just before he takes the state test for his license.

The form would identify the errors the student has made and provide a basis upon which the student's readiness for the license application may be determined.

Driver Evaluation and Progress Report (NPDEA)

This form, divided into four classifications of training—elementary, intermediate, advanced, and expert—may be used to indicate student progress in all the driving procedures and for recommending additional instruction.

Appointment Card

The instructor gives an appointment card with the date and time of the next lesson noted. The card should clarify the penalties to the student for failing to keep the appointment or cancelling the appointment too late.

Form for Waiver of Insurance

This form is signed by the student when he uses his own car for instruction. It absolves the driving school of any responsibility in case of accident or injury.

Payment Agreement

This form, signed by the student at the completion of each lesson, authorizes the school to charge the lessons to the students account at a local department store, provided the school has made such arrangements with the store.

Business Forms

Payment Envelopes

This record contains the instructor's receipts for the day with necessary accounting information.

Cash Slips for Car Repairs

This form, when accompanied by a receipt and signed by an official of the school, authorizes reimbursement to the instructor for necessary minor repairs paid by the instructor.

Accident Report Forms

Accident forms are provided and must be completed within a designated time limit. In addition, instructors are usually required to secure a copy of the police report of the accident.

BASIC REFERENCES

Policy and/or Procedures Manual of the driving school.

State Driver's manual or other material provided license examinee.

State Motor Vehicle Code

Any publicly available material concerned with license examination procedures.

Special Programs

The driving instructor may be called upon to provide help to the community in conducting special programs outside the scope of normal beginning, prelicensing instruction. The most common of these programs are those involving (1) driver improvement, and (2) instruction of handicapped drivers.

DRIVER IMPROVEMENT

The student should know the goals and methods of driving instruction intended to improve the skills of experienced drivers.

Experience is not only an inefficient teacher, but it is generally an incomplete teacher as well. People can drive over a hundred thousand miles and still lack many of the knowledges and skills needed to operate their vehicles safely and efficiently. Much of their driving experience may have served only to establish improper driving habits or reinforce inappropriate attitudes.

Many communities have instituted programs of instruction intended to improve the performance of licensed, experienced drivers. As are the community's "authority" on driving instruction, the professional driving instructor is frequently called upon to conduct, or to assist in conducting, these programs. In order to be able to serve the community's needs, the driver educator should be generally familiar with the objectives and techniques appropriate to the conduct of various types of improvement programs.

Types of Programs

Driver improvement programs can be divided conveniently into two categories, those aimed at the driving population at large, and those directed primarily at groups identified as deficient in driving performance on the basis of their record of violations or accidents.

The term most widely used for programs intending to improve the skills of the population at large is "defensive" driving. Since the typical experienced driver tends to believe he is fully competent to operate an automobile, he is not generally attracted by an "improvement" course, although he may be willing to enroll in a course that will help him "defend" himself against other, less safe drivers. The term "driver improvement," however, is used as is "advanced driving" and a few other terms. The term "defensive driving" will be used here to refer to any program intended for the driving population at large.

Probably the best known improvement program is the "defensive driving course" (DDC) established by the National Safety Council. Sponsorship of these courses, including bearing the costs of promotion, instructors, and facilities, is generally borne by employers, civic groups, or educational institutions. The military services also run general improvement programs. The most extensive of these is the Air Force "Advanced" driving program.

Remedial instruction programs have been administered to drivers whose traffic violations, by their nature or number, identify them as being problem drivers. Since attendance is enforced by threat of fine or jail sentence, there is no need for euphemisms in labeling the courses. On the contrary, use of the term "remedial" or "driving clinic," helps make it clear to the driver that he is deemed to be deficient.

Generally speaking, programs directed toward drivers at large have been concerned primarily with improving skills and knowledges related to safety. Remedial programs, on the other hand, have focused on attitudes in the belief that it is primarily poor attitudes that lead to repeated violations.

The merit of administering totally different programs to the two groups of drivers has been questioned. First, the difference between a "violator" and a "non-violator" is often merely a matter of being caught or not being caught. The performance of the average driver and the attitudes that give rise to these performances are not necessarily any more reflective of safety than are those of the traffic violator. Any driver improvement program—defensive driving or remedial instruction—should aim at the improvement of attitudes.

Conversely, there is no reason to confine the content of remedial programs to attitudes alone. While violations may result primarily from the driver's unwillingness to apply the knowledge and skills that he possesses, a remedial program provides a good opportunity to improve the driver's knowledges and skills. Certainly what is good for the "normal" driver is also good for the traffic violator.

Defensive Driving Course

Except for the lack of instruction in basic automobile control, defensive driving courses generally cover the same areas as beginning driver education courses. These areas include traffic laws, safe driving procedures, hazard identification, driving under adverse conditions, the effects of alcohol and drugs, auto servicing and maintenance, and general traffic citizenship. Since the majority of the adult drivers have never been exposed to a driver education program, the overlap between defensive driving and beginning driver education programs is not undesirable.

Most defensive driving courses are conducted entirely in the classroom and deal primarily with development of safe driving knowledges and attitudes, although an attempt is often made to deal with enhancement of perceptual skills through the use of visual aids. A few driver educators have provided in-car instruction designed to improve (1) skills and habits required in identification of potential hazards, or (2) the ability to select and carry out appropriate emergency procedures, e.g., evasive maneuvers, skid control.

In military improvement programs, and others in which attendance is compulsory, a greater emphasis can be placed upon attitude change than is possible in a course attended by volunteers. The Air Force Traffic Safety Education Program is almost entirely concerned with attitude change. This program makes extensive use of motion picture films portraying situations with which students can identify. Generally speaking, films can provide a more subtle means of developing attitude change (except for "scare" films) than accident statistics, moral persuasion, or even group discussion techniques.

Remedial Programs

As noted earlier, remedial programs tend to focus upon overcoming what may be considered "unsafe" attitudes on the part of the traffic violators toward such topics as speed, the rights of other road users, or the role of traffic enforcement. Although remedial programs vary considerably, they generally involve the elements described below:

Overcoming resistance. The first step in almost any remedial program is overcoming the resistance of the violators to the course itself. The attitude that generally greets the instructor ranges from ridicule to hostility. Most of the violators view themselves as victims of ill fortune or overzealous enforcement. Teenagers in particular tend to feel they have been singled out because of their youth alone.

Initial resistance is best overcome by allowing free expression of feelings. This ventilation of feeling tends to dissipate resistance and leads to at least a superficial acceptance of the course, that is, a willingness to "play the game."

Acceptance of responsibility. As discussion continues, violators tend to "see themselves" in the statements of others. They begin to realize how suspicious their excuses sound to the instructor and the rest of the class. In time, most will show signs of accepting responsibility for their offense—recognizing that their behavior was truly unsafe and that the action taken against them was warranted. The instructor can assist this development of awareness by leading the discussion toward possible consequences of the violator's behavior.

Search for underlying causes. Once the violator accepts his behavior as being unsafe and assumes responsibility for its occurrence, discussion can turn to means of preventing such behavior. A resolution "never to do it again" is not the goal. After all, the violation was rarely the result of a deliberate, premeditated act. More often, it was the last in a series of inappropriate behaviors. A driver was speeding because he did not allow enough time to keep an appointment. A mother was distracted by her child, who was not properly secured by a seatbelt. A driver lighting a cigarette failed to see the car in front stop abruptly. The violator must be led to recognize the nature of the behavior leading up to his violation. He will also, in most cases, recognize other of his own unsafe behaviors in the revelation of others.

In most remedial programs, the violator is released with the assumption that his attitudes towards himself and traffic safety have been changed. Generally this is all there is time for. Courts are typically reluctant to require violators to devote more than a few hours to remedial programs. However, in some cases there is enough time to permit the instructor to utilize the attitude change as a foundation for a broader program of instruction in driving safety.

Rehabilitative Programs

The remedial programs just described are primarily concerned with modifying driving behavior among what might be called "normal" drivers. However, many communities also conduct intensive programs for drivers whose patterns of violations indicate a deep personality problem. The intensive programs, more properly termed "rehabilitative" rather than remedial, are attended by drivers whose records evidence large numbers of violations, extreme aggressiveness or hostility (e.g., assaulting the arresting officer), or abusive use of alcohol or drugs. Although most rehabilitative programs are directed by clinical specialists such as psychiatrists, psychologists, and counselors, driver educators frequently participate in their administration.

Of the "personality" problems that are responsible for unsafe driving, those caused by alcohol abuse head the list. Stimulated by recent activities of the National Highway Traffic Safety Administration, many communities are providing rehabilitative programs for drinking drivers. These rehabilitative programs are not to be confused with remedial programs such as "DWI school" intended primarily for first time offenders. True rehabilitation programs are operated for drivers who are identified as "problem drinkers" on the basis of their frequency of offense, level of blood alcohol, time of arrest, or other sign of excessive alcohol consumption. Rehabilitative programs for groups of problem drinkers constitute a form of "group therapy." While the processes parallel those described in connection with remedial programs, they are typically more intensive and carried out over a longer period of time.

BASIC REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content Methods and Organization*, pp. 323-324, The MacMillan Company, New York, 1966.

Adams, J.F. and Kole, Y. *Driver Rehabilitation: An Approach Based on Diagnostic Differentiation and Group Interaction*, Continental Research Institute, New York, 1969.

American Automobile Association. *Teaching Driver and Traffic Safety Education*, pp. 360-368, Webster Division, McGraw-Hill Book Company, New York, 1965.

Fletcher, Harry D. *Driver Improvement Schools: A Guide for Their Operation*. American Automobile Association, Washington, D.C., 1963.

INSTRUCTING HANDICAPPED STUDENTS

The student should know the techniques required in providing driver education for students with physical and mental handicaps.

Handicapped students for whom driver education is most commonly provided include those with mental, auditory, and/or motor impairments. While research on the performance of handicapped drivers is inconclusive, it strongly suggests that, on the whole, handicapped drivers have a somewhat higher accident potential than "normal" drivers. However, research has also shown that it is possible to provide instruction that will assist handicapped students in either overcoming or compensating for their handicaps to the extent that they become equal to or better than normal drivers.

Teaching the Physically Handicapped

Instruction for students with motor impairments focuses primarily upon the use of special equipment designed to offset the effects of impairment. Students with motor handicaps must learn to operate the special hand or foot controls that can be provided for them. On the whole students with motor impairments can learn to drive with special controls at about the same rate as "normal" students.

The major problem in dealing with students having auditory impairments is one of communication. Communicating course information in the classroom can generally be handled by preparing adequate written materials. However, communicating with students during in-car skill development phases is much more difficult. Some driver educators have developed a set of simple hand signs. Others have devised special in-car displays, e.g., lights, to communicate basic commands to students. For example a red light might mean "stop," and a green light "accelerate."

Students with auditory handicaps must be taught to search for, identify, and interpret visual cues to events that normal drivers would be expected to hear. For example, they must make greater use of the rear vision mirror to assure they are not interfering with the progress of vehicles behind, a situation the normal driver would perceive through the sound of horns. If vehicles ahead slow down and pull to the side of the road without apparent reason, students with auditory handicaps should know to search for visible cues of an approaching emergency vehicle.

Teaching Mentally Handicapped Students

Providing effective instruction for the mentally handicapped (EMH) presents one of the greatest challenges to the driver educator. The instructional task may be divided into two components: curriculum administration and program administration.

Curriculum Administration

In administering the driver education curriculum, the instructor must, of course, focus primarily upon considerations of safety. However, in the case of mentally handicapped students, the instructor has an additional goal which is almost of equal importance—that of enabling an individual to become a productive member of society by improving his mobility. To this end, his instruction must deal not only with the operation of a vehicle but with the broader instruction in consumer education and traffic citizenship. Subjects that assume particular importance in the teaching of handicapped students are the selection and purchase of vehicles, licensing and registration, insurance and financial responsibility, obtaining proper servicing and maintenance—subjects that are of marginal concern to safety but are necessary to the handicapped driver if he is to secure effective transportation from an automobile.

Teaching the mentally handicapped student will consume far more instructional time than will instruction of mentally normal students. Educators who have worked with mentally handicapped students generally recommend that one and a half to two times as much time be made available. In designing teaching experiences for mentally retarded students, the driver educator should bear the following in mind:

> Materials should deal with concrete "real world" experiences rather than abstract concepts.
>
> The complexity of written materials should be minimized. Verbal materials should be prepared at an elementary reading level.
>
> Graphic materials should be used in place of verbal materials. Mentally handicapped students can learn more from a picture of a driving situation than a written description of it.
>
> A great variety of materials should be available to provide alternatives to students having difficulty with a particular type of material. Use of different materials also helps to maintain attention and motivation.

In administering the course, the instructor must accommodate the special limitations and needs of the students. First of all, the mentally handicapped student is, above all, a slow learner. Instructions to students should be detailed, explicit, and given orally. A mentally handicapped student cannot operate from general principles or rules of thumb to the extent that average students can. The instructor must anticipate the need for considerable repetition in the presentation of information and instructions.

Secondly, the mentally handicapped student is quite limited in his ability to process information. The instructor should attempt to deal with but one phase of the learning task at a time. In-car instruction should concentrate upon a single maneuver at a time, the instructor waiting for the student to attain proficiency in that maneuver before progressing.

Thirdly, the mentally handicapped student tends to have a short attention span. Learning activities of one type should continue for 10-15 minutes, then another type of activity should be introduced. In-car sessions should be limited to 20-30 minutes.

Finally, the mentally handicapped student generally needs more frequent rewards than the "normal" student. This is because mentally handicapped students are less motivated by long range goals such as course completion or the ability to drive, than are average students. Their rewards must be immediate. Praise should be lavishly supplied. In addition, they have experienced, on the whole, far more failure and frustration from the school system than other students. The motor skills involved in automobile operation are something at which they can achieve success. It is important to make this apparent from the outset in order to overcome the effects of prior failure.

Program Administration

State departments of education generally establish rules and regulations dealing with programs for mentally handicapped students. These rules and regulations reflect state policies in regard to goals and needs of handicapped students. The driver educator must become familiar with the policies that exist in his state.

The driver educator can also solicit assistance from district special educational personnel in administering the driver education program. He can expect guidance regarding the characteristics of mentally handicapped students and its impact upon the structure of the driver education program. In some cases he may also expect direct help in administering the program. The most common means of combining special education and driver education instruction are the following

Team Teaching. Classroom instruction is administered by both the special education and driver education teachers. Practice driving is then provided by the driver education teacher.

Advanced Preparation. The verbal components of driver education are taught by the special education teacher prior to the enrollment of the student in the driver education program. The driver education teacher would then provide both classroom and in-car instruction.

Concept Reinforcement. The driver educator provides both classroom and in-car instruction. Then the special education instructor covers key driver education concepts through traditional programs for the mentally handicapped.

BASIC REFERENCES

Aaron, James E. ***Driver Education for the Handicapped,*** **Safety Center, Southern Illinois University, Carbondale, Illinois, 1971.**

Michigan State University, ***The Driver Education Program for the Mentally Handicapped.*** **Department of Education, Michigan State University, Lansing, Michigan, 1968.**

Oklahoma State University. ***Steps for Teaching the Physically Handicapped to Drive,*** **Southwest Center for Safety, Oklahoma State University, Stillwater, Oklahoma, 1970.**

Stiska, Warren C. "In-Car Instruction for the Mentally Handicapped," ***Journal of Traffic Safety Education,*** **vol. 20, no. 1, October 1972.**

Part III

DRIVING TASKS

Part III

Driving Tasks

Contents

A. Basic Controls

B. Driving Procedures
  1. General Procedures
  2. Normal Driving Situations
  3. Adverse Driving Conditions
  4. Night Driving
  5. Special Conditions

C. Emergency Procedures

D. System Maintenance
  1. Driver
  2. Car
  3. Traffic/Highway System

E. Appendix
  1. Suppliers of Instructional Aids (Master List)
  2. Suppliers of Resource Materials (Master List)

Part III
Driving Tasks

The student should know the nature of the performances that constitute safe and effective driving and should know the nature of and possess the knowledges and skills that underlie these performances.

The driver educator like any other teacher should be an expert in his field. He should be thoroughly familiar with the performances that constitute the driver's tasks as well as the knowledges that enable as well as motivate drivers to operate automobiles safely and effectively. Moreover, he must himself possess these knowledges and skills to the highest degree of proficiency. In other words, he must be an expert.

In the early days of driver education, driving instructors frequently were drawn from the existing teaching staff and pressed into service without the benefit of instruction or an evaluation of their skills. It is not surprising that many of the instructors were run-of-the-mill drivers and therefore ineffective teachers. Unfortunately, the same situation prevails in many schools today.

This section of the Guide goes into considerable detail concerning the performances involved in operating an automobile. The emphasis is clearly upon instruction that is related to the driver's tasks. While many of the objectives are not directly concerned with vehicle operation, all involve behaviors that in one way or another influence the safety and effectiveness with which the car is operated.

Instructional objectives concerned with the driving tasks are divided into the following sections.

Section A

Basic Controls–Objectives concerned with controlling the motion of the automobile, without regard to surrounding conditions.

Section B

Driving Procedures–Objectives concerned with maneuvering the car in response to conditions that prevail in normal driving, and anticipating the activities of other drivers and responding in a way that will prevent a hazard from arising.

Section C

Emergency Procedures–Objectives concerned with assuring that the driver, his car, and the overall highway transportation system are in such condition as to permit safe and effective driving.

Section D

System Maintenance–Objectives concerned with assuring that the driver, his car, and the overall highway transportation system are in such condition as to permit safe and effective driving.

Within each section, various tasks are described separately. The description includes (1) a listing of task requirements, including performances, knowledges, and skills, (2) the learning problems associated with each task and (3) a listing of instructional aids and resource materials related to the particular task.

The aids and resources that are available pertaining to any one task are far too numerous to allow an exhaustive inventory to be prepared. Those that appear in the Guide are those that are most relevant to the instructional requirements as they are identified in the Guide. In the case of textbooks, only those that have a clear performance orientation and are organized in terms of driving task requirements could be accommodated by the organization of the Guide. Many excellent texts and non-textual publications are omitted. Their omission does not imply that they are not worthy publications. Nor does inclusion of any text constitute an endorsement.

III-A

Basic Controls

The student should know the nature of and possess the knowledges and skills required to control the motion of the car.[1]

The ability to control the motion of the car, that is, its speed and direction, is fundamental to driver education. Obtaining this ability is what primarily motivates secondary school students to enroll in driver education courses. The tasks associated with car control consist of the following:

1. Preoperative procedures.
2. Starting the engine.
3. Forward acceleration, including shifting.
4. Steering, including maintaining direction and turning.
5. Speed control.
6. Downshifting.
7. Stopping, including braking.
8. Backing.
9. Turnabouts.

Each of these tasks depends upon the acquisition of relatively complex perceptual motor skills, skills that must be developed through practice. Unless a secondary school student has already received considerable practice before enrolling in a driver education course, he is not likely to approach what could be called "mastery" of automobile control skills before he graduates. Many months and years of driving experience are generally required before a driver reaches his highest level of proficiency. All that can be achieved in a secondary driver education curriculum is to provide the driver with sufficient control skill to execute the above maneuvers within the boundaries established by normal roadway and traffic characteristics while at the same time attending to surrounding conditions.

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[1] For clarification, the term "car" always refers to the automobile driven by the individual whose task is being described. The term "vehicle" refers to those vehicles encountered by the car driver.

Preoperative Procedures

Prior to starting the car, the student should carry out those preoperative procedures necessary to assure that the car may be operated safely.

How well and how safely the driver will be able to operate the car is greatly influenced by the activities he carries out before he even attempts to drive. Such preoperative procedures include (1) steps taken to improve visibility, including cleaning windshields and adjusting mirrors, (2) making sure that occupants, particularly children, are properly seated with safety belts fastened, (3) checking to make sure that there are no loose objects that could interfere with the control of the car or create a hazard in case of a sudden stop or accident, and (4) generally inspecting the condition of the car.

DRIVING TASK REQUIREMENTS

The student should know the location, function, and operation of control instruments, gauges, and other accessories.

Preoperative Procedures

There are specific preoperative procedures and precautions a driver should attend to, outside as well as inside the car, before he puts the car to motion. To ensure his own safety and that of his passengers, other motorists, and pedestrians, the driver should:

Remove objects in the car's path.

Inspect the tires and direction of the front wheels prior to driving.

Clean windows and windshield.

Maximum visibility must be ensured. A dirty windshield inside or out intensifies glare from the sun and from oncoming headlights.

Condensation should be removed from the windshield and windows with a cloth, not with the hand, to clear the surface of moisture and dust. A bare hand will only smear the surface.

Gauges, Instruments, and Accessories

To be generally familiar with the control panel and instruments, the driver should be able to:

Identify the speedometer, fuel gauge, temperature gauge, oil gauge, ammeter, and odometer and interpret their readings.

Identify and operate the light switches, windshield wipers and washers, temperature controls, radio, and dimmer switch.

Identify the accelerator, brake pedal, clutch pedal, gear shift selector, parking (emergency) brake, directional turn signal lever, steering wheel, emergency flashers, and ignition.

Snow should be brushed off the roof, hood, and trunk so that it will not blow onto other vehicles, or slide onto the windshield or rear window when the car is in motion, distracting the driver or blocking his vision.

Remove all loose objects from the dashboard, sun visor, rear window deck, floor, and from under the seat.

Loose objects may interfere with driver's vision or operation of the controls or distract his attention.

Fasten and adjust safety devices and adjust mirrors and driver's seat.

When correctly adjusted, the seat and mirrors help to provide the driver with a maximum field of vision. Mirrors give maximum visual coverage to the rear areas, allowing the driver to view those areas by shifting his eyes rather than his head or body.

Firmly clamped and correctly adjusted head supports minimize whiplash by stopping the backward motion of the head and snapping effect. However, an improperly adjusted head support may be more hazardous than none at all.

Seat the passengers so that his vision is not obscured.

A maximum of three people, including the driver, should be permitted in the front seat. Some states prohibit more than three people in the front seat. Each person should have a seat belt.

Car seats or beds should be used for children under the ages of three or four; older children and adults should have seat belts fastened and adjusted.

Some 8,000-10,000 lives could be saved each year if drivers and passengers used safety belts.

Injury occurrence could be reduced by 60 percent if drivers and passengers used seat belts.

Check to see that all doors are completely closed and locked before starting the engine.

Locked doors reduce the chance of driver and/or passengers being ejected during a collision.

Locked doors may prevent an intruder from gaining entry to the car.

The student should know the skills for locating and/operating the controls, accessories, and gauges.

The driver must develop the ability to locate the various controls and accessories without having to look for them and be able to activate them as quickly as required.

He must develop a "feel" for the car–e.g., pressure required to activate the brakes, seat adjustment that suits him best, the most comfortable position of the right foot on the accelerator, the location and operation of the wiper control.

The driver must be able to locate and read the gauges at a glance so that he will be able to give maximum attention to the roadway and to the operation of the car.

LEARNING PROBLEMS

The student should know the kinds of difficulties they may be experienced in learning preoperative procedures and the location and operation of controls, accessories, and gauges.

Tension and Apprehension

A beginning driver may be apprehensive and nervous during initial in-car instruction. In this state, he may indicate he understands the principle or procedure the instructor is discussing, when, in fact, he has little concept of what the instructor is talking about. The instructor must minimize the student's tension and put him at ease so that he will be more receptive to learning.

Improper Seating Position

There is a tendency for a beginning driver (and experienced drivers, too) to sit too close to the steering wheel. This restricts arm movement to some degree, making it difficult to locate and/or reach controls and accessories. His reaching movements are awkward rather than natural, as they would be if he were seated correctly.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	–	–
Classroom posters	–	–
Handouts/pamphlets	American Medical Assoc. Committee on Medical Aspects of Automotive Safety	"Safety Belts Save Lives"
	Auto Dealers Traffic Safety Council Auto Industries Division, Highway Users Federation	"Smart People Wear Safety Belts"
	National Safety Council	"Children in the Car" fact sheet "You're Putting Me On"

FILMS/FILMSTRIPS/SLIDES

Instruments/Gauges, and Controls

Classroom Visual Aids

"Fundamental Driving Techniques I,"* 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

"Informational Devices," 8 min, 3 minutes, color, McGraw Hill Book Co.

"Switches, Instruments and Controls," 67 frames, b/w, General Motors Corp.

Preoperative Adjustments/Safety Devices

Classroom Visual Aids

"Broken Glass," 13 minutes, color, University of California Extension Media Center.

"Intersection Collision," 10½ minutes, color, University of California.

"Getting Ready to Drive," 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

Preoperative Adjustments/Safety Devices (Continued)

"Pre-Driving Habits," super 8mm film loop or standard 8 mm, 3 minutes, color, McGraw Hill Book Company.

"Red Light Return," 14 minutes, color, Charles Cahill Associates, Inc.

"Safety Belt for Suzie," 11 minutes, color, Charles Cahill Associates, Inc.

"Safety Through Seat Belts," 12 minutes, b/w, Charles Cahill Associates, Inc.

"Safety Features," No. 8, Safety Features Series, 30 minutes, b/w, Indiana University.

"UFO, Unrestrained Flying Objects," 14 minutes, color, General Motors Corp.

Simulator Films

"A Drive in an Automatic Shift Car,"* 20 minutes, color, AEtna Life & Casualty Co.

"You and the AEtna Drivotrainer System,"* 20 minutes, color, AEtna Life & Casualty Co.

"You Take the Wheel,"* 22 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

Basic References

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System*, film sections as follows: "The Drivotrainer System," and "Automatic Shift Car."

Allstate Insurance Company. *Allstate Good Driver Trainer System*, film booklet, "You Take the Wheel."

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, 6th Edition, pp. 324-345.

Anderson, William G. *In-Car Instruction: Methods and Content—A Manual for Teachers of Driver and Traffic Safety Education*, pp. 87-97.

Anderson, William G. *Laboratory Manual for Learning to Drive*, p. 5.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies*, pp. 21-32.

Anderson William G. *Teacher's Manual for Learning to Drive*, pp. 18-21.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 40-45, 64-68, 127-128.

McKnight, A James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 11-0 - 11-5.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, pp. 12-14.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers*, pp. 46-49, 86-90.

Quane, W. Laurence. *Utilizing the Multiple Car Driving Range*, pp. 6-8, 25, 60.

Supplementary References

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods, and Organization*, pp. 140-141, 214-215, 254.

American Automobile Association. *Sportsmanlike Driving: Teacher's Guide*, pp. 23-24.

American Automobile Association. *Teaching Driver and Traffic Safety Education*, pp. 173-180, 181-193.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, pp. 45-48.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, pp. 236-240.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 44-63.

Fine, Paul A. "Why People Resist Wearing Safety Belts," *Concepts/For Traffic Safety*, vol. 3, no. 1, pp. 5-9, AEtna Life & Casualty Co., Hartford, Conn.

Glenn, Harold T. *Youth at the Wheel*, pp. 87-101.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Supplementary References (Continued)

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 14-22; 57-59.

Kihlberg, Jaakko K., "Non-Ejectees Much Safer When Wearing Safety Belts," *Traffic Safety,* vol. 70, no. 6, pp. 16-17, National Safety Council, Chicago.

Lawlor, John D. "Do We Need a Buckle-up Law?" *Traffic Safety,* vol. 72, no. 1, pp. 22-23, 34-35, National Safety Council, Chicago.

Lhotka, Donald C. "The Seat Belt Story," *Traffic Safety,* vol. 64, no. 11, pp. 22-24, 34-35, National Safety Council, Chicago.

North American Professional Driver Education Association. *The New Driver's Guide,* pp. 9-12.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition,* pp. 51-61, 63-66.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education; Learning to Drive Defensively,* pp. 200-210.

Terry, S.L. "Passive Restraints - Part II," *Concepts/For Traffic Safety,* vol. 4, no. 1, pp. 5-8, AEtna Life & Casualty Co., Hartford, Conn.

Toms, Douglas. "Passive Restraints" - Part I," *Concepts/For Traffic Safety,* vol. 4, no. 1, pp. 2-4, AEtna Life & Casualty Co., Hartford, Conn.

Starting the Car

The student should be able to start the engine under normal conditions.

While starting the engine is a relatively simple procedure, difficulties causing inconvenience and possible damage to the engine may result if it is not performed properly.

DRIVING TASK REQUIREMENTS

The student should know how to start the engine of cars equipped with manual and automatic transmissions.

Starting the Engine

To start the engine, the driver should:

Depress the clutch in a manual shift car during the starting procedure.

Depressing the clutch until the engine starts takes strain off the drive train and prevents the car from lurching forward if the gearshift is not in the neutral position.

Set an automatic choke by depressing the accelerator fully; set a manual choke by pulling it out slightly.

It is unnecessary to pump the accelerator if it is adjusted to climatic conditions. The practice can flood the engine and should be avoided.

In cold weather extra fuel may be required to start the engine if the choke has not been adjusted for winter temperatures. Pumping the accelerator once or twice provides the extra fuel.

In cold weather, a manual choke should be pulled out farther than normally for easier starting.

Release the accelerator, then depress it slightly.

Pumping the accelerator may flood the engine.

Place the gearshift lever in the neutral or park position in an automatic shift car, in the neutral position in a manual shift car, in preparation for starting the engine on a level roadway.

The engine of an automatic shift car will start only when the gearshift lever is in park or neutral. In neutral, transmission gears are disengaged, and in park, the transmission is locked. The car cannot move under its own power with the gearshift lever in either position.

Turn the ignition key to "on" position and then to "start," holding it in this position until the engine starts, then release the key.

> Most cars have a five-position switch. The positions are, from left to right: "accessories," "locked," "off," "on," and "start."

Starting the Car on a Hill

Starting the car on a hill is essentially the same as starting it on a level roadway. In manual shift cars, the driver should use the brake pedal, accelerator pedal, and clutch to prevent premature movement in either direction. In automatic shift cars, the driver should set the gearshift lever in the park position.

Failure of Engine to Start

A driver may occasionally encounter difficulties in starting the engine. He should attempt to determine the cause for the failure and be able to correct minor difficulties responsible for this problem.

If the starter properly cranks the engine but the engine fails to start, the driver should:

- Check the fuel indicator to make sure there is sufficient gasoline in the tank.
- If the engine is damp, wipe off spark plugs and ignition wires with a dry cloth.
- If the smell of gasoline indicates the engine is flooded,
  - Depress the accelerator to the floor to open the automatic choke.
  - Turn the ignition key to the start position and crank the engine for a few seconds.
  - Repeat the procedure until the engine starts.

If the starter makes no sound or cranks the engine very slowly, the driver should:

- Make sure the gearshift lever is in the park or neutral position in an automatic shift car.
- Check the battery power by turning on headlights or some accessory.
  - If the power is deficient, check the battery connections and terminals.
    - If loose, tighten, if dirty, clean.
    - If connections are adequate, the battery is weak and must be replaced; or a start must be obtained from another battery by means of "jump" cables. (See Roadside Servicing.)

Idling the Engine

After the engine has started, the driver should not idle the engine except for specific circumstances—for example, to defrost the windshield, or to climb a steep hill immediately, or to enter a high speed roadway before normal circulation in the car is obtained.

The driver should avoid prolonged idling in cold weather because it keeps the choke closed longer, which interferes with the flow of air into the carburetor. The result is a very rich gas/air mixture used during the idling period. Instead of idling the engine, the driver should drive slowly. This allows the engine to warm up, the oil to circulate, and the gas/air mixture to be regulated normally.

LEARNING PROBLEMS

The student should know the kinds of difficulties that may be experienced in learning to start the engine.

Releasing the Key

Student drivers may experience difficulties in learning when to release the key once the engine has started. The instructor should point out that there is a difference in the sounds made by the starter, and by the engine once it has been started. He should instruct the beginning driver to release the key immediately after the driver hears the change in sound.

Other Common Problems

Pumping the accelerator before starting the engine. Pumping the accelerator when attempting to start a flooded engine.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--
Handout/pamphlet	National Safety Council	"When Your Car Stalls" fact sheet
Mock-up of car instrument panel.	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Basic Maneuvers II,"* 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

"Fundamental Driving Techniques II,"* 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

Simulator Films

"A Drive in an Automatic Shift Car,"* 20 minutes, color, AEtna Life & Casualty Co.

"Shifting Skills,"* 16 minutes, color, AEtna Life & Casualty Co.

"You and the AEtna Drivotrainer System,"* 20 minutes, color, AEtna Life & Casualty Co.

"You Take the Wheel,"* 22 minutes, color, Allstate Enterprises.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System,* film sections as follows: "The Drivotrainer System," "Shifting Skill," and "Automatic Shift Car."

Allstate Insurance Company, Allstate Good Driver Trainer System, film booklet, "You Take the Wheel."

American Automobile Association. *Practice Driving Guide for Use with Sportsmanlike Driving,* Sixth Edition, p. 8.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 346, 347 and 354.

Anderson, William G. *In-Car Instruction: Methods and Content: A Manual for Teachers of Driver and Traffic Safety Education,* pp. 89-95, 305.

Anderson, William G. *Laboratory Manual for Learning to Drive,* p. 5.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies,* pp. 32-33.

Center for Safety Education, New York University. *Driver Education and Traffic Safety,* p. 129.

McKnight, A. James, and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 12-0 - 12-3.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives,* pp. 16-18.

Quane, W. Laurance. *Utilizing the Multiple Car Driving Range,* pp. 6-8, 25, 61.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization,* pp. 215-219.

American Automobile Association. *Teaching Driver and Traffic Safety Education,* p. 135.

American Automobile Association. *Sportsmanlike Driving: Teacher's Guide,* pp. 25-28.

Anderson, William G. *Laboratory Manual for Learning to Drive,* p. 5.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education,* pp. 232-241.

Center for Safety Education, New York University. *Man and the Motor Car,* pp. 64 and 65.

Department of Motor Vehicles, District of Columbia. "Traffic Safety Reporter," vol. 12, no. 12, December 1969, p. 2.

Glenn, Harold T. *Youth at the Wheel,* pp. 101-103.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 23, 27, 38-39, 131, 318.

North American Professional Driver Education Association. *The New Driver's Guide,* p. 12.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition,* pp. 53, 70-74, 87-88, 206-207.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively,* pp. 214-215.

Accelerating and Shifting

The student should be able to shift gears (manual shift car) and accelerate smoothly from a standing position on all gradients and under all road surface conditions.

The ability to accelerate smoothly requires precise control of accelerator pressure and, in a manual shift car, coordination of the accelerator and clutch. While smooth acceleration itself is primarily of concern to passenger comfort, safe driving demands that the driver be able to perform the task proficiently enough that his attention may be devoted to other requirements imposed by the driving environment. The ability to control the car while accelerating is somewhat complicated by uphill grades and slippery road surface conditions.

DRIVING TASK REQUIREMENTS

The student should know the procedures for accelerating on level roadways and hills.

Accelerating in a Manual Shift Car

Manual shift cars are produced with either a three-speed or four-speed transmission. The same acceleration procedures apply to both; procedures for a four-speed transmission merely have one additional shifting step.

In a three-speed, manual shift car, the driver should:

Depress the clutch pedal while keeping firm pressure on the foot brake and shift to first gear.

Release the parking brake.

Move the right foot from the foot brake to the accelerator, depressing it slightly, simultaneously releasing the clutch slowly until it reaches the friction point.

> Friction point is that point when the driver can "feel," that the engine is moving the car.

Release the clutch completely and depress the accelerator pedal until the car gains adequate speed to shift to second gear.

Depress the clutch again and shift to second gear, again coordinating accelerator pressure with clutch release.

> A speed of about eight miles per hour provides the car with enough momentum while the engine is disengaged, to permit shifting smoothly to second gear.
>
> Since the car is in first and second gear for only a few seconds, the driver should keep the left foot poised above the clutch pedal, but not depressing it, until he has completed shifting.

Depress the clutch a third time and shift to third gear, coordinating accelerator pressure and clutch release.

A speed of 15 to 20 miles per hour provides the car with momentum enough, while the engine is disengaged, to permit shifting smoothly to third gear.

Once the car is in third (high) gear, the driver should move his left foot away from the clutch to avoid "riding" it. "Riding the clutch" can be damaging if done for long periods of time.

Accelerating in an Automatic Shift Car

Accelerating in an automatic shift car is less complex than in a manual shift car because certain changes take place automatically in the transmission when the driver moves the selector lever. In general, the drive position provides an adequate range of gear ratios for most traffic situations and most forward driving is done in this position.

To accelerate from standing position on a level roadway in an automatic shift car, the driver should:

Apply the foot brake and place the gear selector in the drive position; release the parking brake if it is on.

Depressing the brake before shifting into a drive position in an automatic shift car prevents the car from lurching.

Release the brake pedal and depress accelerator pedal to reach desired speed.

Accelerating on Hills

When accelerating from a standing position on a hill, the driver must operate several of the basic controls somewhat simultaneously to prevent the car from rolling backward. In a manual shift car, he must skillfully manipulate the clutch, gear shift lever, and foot and parking brakes as he accelerates. In an automatic shift car, he must coordinate the use of the foot and/or hand brake with the accelerator.

On upgrades–

In manual shift cars, the driver should depress the clutch, shift to low gear, release the brake pedal, and move the right foot to the accelerator, then, simultaneously depress the accelerator, release the clutch, and release the parking brake, coordinating the release of the clutch with the application of pressure on the accelerator.

In automatic shift cars, he should set the selector lever on drive, release the parking brake and/or foot brake while simultaneously depressing the accelerator.

On downgrades–

In manual shift cars, he should shift to low gear, release the parking brake, and ease off the brake pedal, then gradually release the clutch all the way and depress the accelerator.

In automatic shift cars, he should place the selector lever in low or drive, release the parking brake, ease off the brake pedal, and depress the accelerator.

Making Small, Precise Movements

Occasionally it may be necessary for the driver to make small, precise movements–when parking or in heavy, slow-moving traffic, for example. Under such conditions, when even idling speed may be too fast, the driver should not utilize the accelerator pedal to control the movement of the car. Rather, he will find it helpful to control movement–

In a manual shift car, by varying the pressure on the clutch pedal.

In an automatic shift car, by applying pressure to the brake pedal.

The student should know and possess the skills that are necessary for correctly accelerating on level roadways and hills.

To accelerate smoothly on a level roadway in a manual shift car, a driver must be able to release the clutch pedal to the friction point with his left foot and simultaneously depress the accelerator slightly with his right foot. He must also possess skill to shift gears noiselessly by coordinating the operation of the clutch and gearshift.

To accelerate on an upgrade in a manual shift car, the driver must be able to coordinate the operation of the parking brake, foot brake, clutch, accelerator, and steering wheel; in an automatic shift car, the parking brake, foot brake, accelerator, and steering wheel—all in a manner that prevents the car from rolling backward and provides a smooth, forward movement.

LEARNING PROBLEMS

The student should know the kinds of difficulties that may be experienced in learning to accelerate.

Smooth Gradual Acceleration

Smooth, gradual acceleration may be a problem for a beginning driver until he has learned hand-foot coordination to operate the gearshift lever, clutch, and accelerator pedal. He must be able to sense or "feel" when the friction point is reached when shifting gears while accelerating in a manual shift car.

Overacceleration

A beginning driver may not realize there is a delayed effect in the response of the car to initial pressure on the accelerator pedal. The speed of the car is not affected instantaneously by the movement of the accelerator pedal. Lacking this information, a new driver is likely to overaccelerate, then abruptly decelerate, which causes a rapid, lurching forward motion of the car.

Acceleration on an Upgrade

A beginning driver, when learning to accelerate on an upgrade in a manual shift car, will have difficulty coordinating the operation of all the control devices necessary to keep the car from rolling backward. He will have to learn to operate simultaneously and/or sequentially, the hand brake, foot brake, gearshift lever, clutch, accelerator, and steering wheel.

The problem may also exist for a new driver using an automatic shift car, but to a somewhat lesser degree because of the absence of a clutch.

Acceleration on a Steep Downgrade

A beginning driver, when learning to accelerate on a steep downgrade from a standing position, will have some initial difficulty accelerating smoothly and at a reasonable rate of speed. He will have to learn to coordinate the brake and clutch to achieve a smooth acceleration.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard or traffic situation board	--	--
Gear shift model	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Basic Maneuvers I,"* 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

"Basic Maneuvers II,"* 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

"Fundamental Driving Techniques II,"* 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

"Fundamentals of Driving,"* 54 frames, color, No. 4 Traffic Safety Education Series, Society for Visual Education, Inc.

"Manual Gearshift," 8 mm, 3 minutes, color, McGraw Hill Book Co.

"Putting the Car in Motion," 8 mm, 3-4 minutes, color, McGraw Hill Book Co.

"Starting on an Upgrade," 8 mm, 3-4 minutes, color, McGraw Hill Book Co.

Simulator Films

"Blending in Traffic,"* 20 minutes, color, AEtna Life & Casualty Co.

"Shift for Yourself,"* 26 minutes, color, Allstate Enterprises.

"Shifting Skills,"* 16 minutes, color, AEtna Life & Casualty Co.

"You and the AEtna Drivortrainer System,"* 20 minutes, color, AEtna Life & Casualty Co.

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The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

Basic References

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System*, film sections as follows: "The Drivotrainer System," "Shifting Skill," and "Blending in Traffic."

Allstate Insurance Company. Allstate Good Driver Trainer System, film booklet, "Shift for Yourself."

American Automobile Association. *Practice Driving Guide for Use with Sportsmanlike Driving*, 6th Edition, pp. 9-12, 21-22.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Basic References (Continued)

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* 6th Edition, pp. 347-349, 352-355, 357-358, 397-400.

Anderson, William G. *In-Car Instruction: Methods and Content—A Manual for Teachers of Driver and Traffic Safety Education,* pp. 100-105, 129, 260-261.

Anderson, William G. *Laboratory Manual for Learning to Drive,* p. 7.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies,* pp. 39-40, 62, 63.

Anderson, William G. *Teacher's Manual for Learning to Drive,* pp. 21-23, 26.

Center for Safety Education, New York University. *Driver Education and Traffic Safety,* pp. 131, 135-139, 146, 147.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume 1: Task Descriptions,* pp. 13-0 - 13-5.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives,* pp. 20-25.

Quane, W. Laurance. *Utilizing the Multiple Car Driving Range,* pp. 7-8, 25-26, 62.

Supplementary References

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization,* pp. 215-219, 254, 255.

American Automobile Association. *How to Drive,* p 29.

American Automobile Association. *Sportsmanlike Driving: Teacher's Guide,* pp. 27-32.

American Automobile Association. *Teaching Driver and Traffic Safety Education,* pp. 190-191.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education,* pp. 232-236, 241-249, 260-262.

Center for Safety Education, New York University. *Man and the Motor Car,* pp. 66-69, 72-75, 84, 85.

Glenn, Harold T. *Youth at the Wheel,* pp. 176-179, 190-192.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 24, 26-28, 258-259, 316, 326.

Kearney, Paul W. *How to Drive Better and Avoid Accidents,* p. 194.

North American Professional Driver Education Association. *The New Driver's Guide,* pp. 16-17, 46-48.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition,* pp. 69-70.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively,* pp. 215, 218, 225, 226.

Steering

The student should be able to steer the car so as to maintain a path within the limits of a roadway lane at all speeds and under all rates of roadway curvature.

The ability to control the car's direction of travel is paramount to safe driving. It is a task that is performed continuously throughout operation of the car. At very slow speeds, the task is relatively simple. However, as the speed of the car increases, more precise control is needed to maintain a desired path, and the driver must focus his attention further ahead in order to anticipate required control actions.

DRIVING TASK REQUIREMENTS

The student should know how to steer correctly.

Steering on Straight Roadways

Steering a car occupies the driver full time. Even on a straight roadway, the car will wander off course from various causes—crosswinds, irregularities in the surface of the road, play in the steering wheel, or tire pressure. To keep the car on the path angle, the driver must make corrections by continuously moving the steering wheel. This, in turn, requires him to move his hands almost continuously. Road edges and lane markings provide the driver with cues to help him maintain the correct path angle.

To steer the car, the driver should:

Place both hands on the upper half of the steering wheel.

One-hand steering is a contributory factor in a significant number of accidents.

When both hands are placed on the upper half of the steering wheel, the elbows are naturally positioned away from the body. Consequently, the driver can quickly turn the steering wheel as much as required because his torso will not interfere with the arm movements. This position also permits the driver's arms to be in a relaxed position. Thus, when the car sways rapidly to either side, the driver's arms will swing, automatically moving the steering wheel to correct the direction of travel.

The basic 10 o'clock and 2 o'clock hand position permits maximum use of the top half of the wheel and maximum application of the driver's strength to offset wheel pull from blowouts or soft shoulders.

Grasp the steering wheel firmly.

Make gradual steering corrections, avoiding abrupt steering movements which may result in oversteering.

As the speed of the car increases, the magnitude of the steering corrections should be decreased to prevent oversteering.

Oversteering at high speeds is a major factor in traffic accidents.

Maintain a position in the center of the driving lane by looking well ahead along the middle of the lane.

Keeping the eyes focused well ahead aids in the recognition of approaching hazards and helps the driver in selecting a safe path and in steering the car smoothly.

Failure of the driver to focus well ahead in order to maintain the car within lane boundaries is a contributing factor in many accidents.

Constant eye movement not only prevents the fixed stare, but also enables the driver to be continually aware of his relationship to the roadway.

Steering and Turning

The student should plan well ahead for his turn by observing the intended path for traffic, pedestrians, posted regulations and other roadside signs, and pavement markings. In preparing to turn, he should:

Signal for the turn at an appropriate point and well in advance of the turn, observing the response of other drivers to his signal.

If the car's directional turn signals are inoperative, the appropriate hand signals should be used.

In a manual shift car, shift gears, if necessary, prior to the turn, not during the turn.

Shifting gears while turning should be avoided because both hands should be on the wheel. In addition the activity of shifting distracts the driver's attention from potential hazards.

Keep both hands on the steering wheel and the foot free to brake, if necessary.

Reduce speed in proportion to the sharpness of the turn.

Slowing down before the turn will prevent a possible skid in the turn. Abrupt turns and lane changes can also cause the car to skid.

Again check the intended path to make sure it is clear.

A significant number of accidents can be attributed to the driver's failure to observe vehicles ahead in the intended path during a lane change or a turn.

In turning, the driver should:

Turn the top of the steering wheel in the direction of the turn in approximate proportion to the sharpness of the turn.

Keep both hands on the outside of the steering wheel rim.

Turning with one hand usually results in wide turns.

Reaching inside the wheel is awkward, and the horn may be struck accidentally.

Use the hand-over-hand technique for sharp turns.

The hand-over-hand technique allows the driver to turn the wheel quickly while maintaining control of the car.

With small foreign or sports cars, the gear ratio is such that fewer revolutions of the steering wheel are required for large turns, and thus the hand-over-hand technique need not be used.

In making a right turn, the driver should:

Place his left hand on the left side of the steering wheel between the 8 and 10 o'clock position.

Rotate the steering wheel clockwise with the left hand to the 2-4 o'clock position.

Place the right hand between the 8-10 o'clock position and move the hand clockwise to the 2-4 o'clock position.

Repeat the procedure until the desired turn state is achieved.

In making a left turn, the driver should:

Reverse the procedures indicated above for a right turn.

In completing the turn, the driver should:

Rotate the wheel in the opposite direction at a rate that will place it in the neutral "straight ahead" position as the desired direction is attained.

Oversteering when completing a turn is a cause of a significant number of accidents each year.

If he elects to do so, permit the steering wheel to return by letting it slip through his hands. To maintain directional control, he places his palms on the outside of the steering wheel, grasping it slightly and being ready to grasp it firmly, if necessary.

The driver should not permit the steering wheel to return in this manner except under the following conditions: When the speed of the car is slow, but not so slow that the wheel will not slip back to the straight ahead position; when the magnitude of the turn is large; and when the car does not have power steering.

After completing the turn, the driver should:

Resume speed according to the posted limit and/or traffic conditions.

Make sure the turn signal has been cancelled.

The student should know the skills involved in steering on a straight roadway and for left and right turns.

Straight Roadway

The driver must develop the ability to perceive when the car has moved from the desired path and to make the necessary steering corrections with a minimum amount of reversals. To anticipate steering corrections early enough to make them smoothly, the driver should focus about eight to twelve seconds ahead.

He must learn to judge how much to turn the wheel back to the neutral position as the car's path angle begins to coincide with the intended path. In addition, he must learn to judge the maximum rate and magnitude of steering change that is possible at various speeds without causing discomfort or causing the car to skid.

He must be able to scan off-road movements while he continues to concentrate on the roadway well ahead and keep the car in the desired path.

Turning

The driver must be able to perceive a disparity between his intended path and the car's existing path angle and judge the rate at which to turn the steering wheel in order to align the car's path angle with the intended path at any particular rate of speed. This process continues throughout a turn.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to steer the car.

Maintaining Direction on Straight Roadways

Even the straightest roadway will require the driver to make steering corrections. A student driver having difficulty in maintaining direction on a straight roadway is probably not focusing well ahead.

If the driver is drifting gradually to one side of the roadway he is most likely focusing his attention on one edge of the intended path and watching the front fender in relation to that edge. He essentially begins steering in the direction of his focus, and as a result the car drifts in that direction.

Instructing the beginning driver to aim the car for a point in the middle of the roadway and well ahead of the car should help eliminate the cause of this problem.

Maintaining Lane Position

Some drivers have difficulty in judging the lateral position of the car. This becomes apparent when the student driver appears to have little trouble maintaining a relatively straight path but is inclined to drive to the right or left of the center of the driving lane. By periodically shifting his focus from well ahead of the car to points that are close to the car, the student driver should be able to align the car better in relation to the lane markings.

The instructor should point out that the driver's position is located on the left side of the car and, consequently, when the car is centered on the roadway, the driver should be to the left of center of the roadway.

Coordinating Steering, Speed Control, and Surveillance When Turning

The ability to consistently make smooth, gradual turns without skidding, impeding traffic, or drifting from the center of the roadway is developed when the driver is able to coordinate steering, speed control, and surveillance activities. Until he learns this, he may make turns that are too wide or too sharp, or he may go into a skid on a turn.

Turns that are too wide may result when the driver fails to return the steering wheel to its natural position. Controlled slipping (See Driving Task Requirements for Steering) and reversed steering may be used to straighten the wheel. (Reversed steering is a modified version of the hand-over-hand technique where the driver physically turns the steering wheel in the opposite direction.) New drivers may also hold the steering wheel until the car is facing the direction of the new path, and then begin the recovery.

Left Turns Onto One-Way Streets

Beginning students are likely to become confused about the lane usage regulations and guidelines for turning onto one-way streets from one- and two-way streets. Turning from a one-way street into a two-way street is also likely to require an explanation on lane selection. Diagrams can be useful.

Estimating Whether Turn Can be Completed Safely

Many beginning drivers have difficulty determining when it is safe to make a left turn. The determination must be based upon the driver's estimates of the speed and distance of approaching oncoming and cross traffic.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard or traffic situation board	--	--
Mock-up of driver's seat and controls	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Basic Maneuvers I,"* 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

Simulator Films

"The Art of Turning,"* 26 minutes, Allstate Enterprises

"A Drive in an Automatic Shift Car,"* 20 minutes, color, AEtna Life & Casualty Co.

"A Drive in a Manual Shift Car,"* 22 minutes, color,

"You and the AEtna Drivotrainer System,"* 30 minutes, color, AEtna Life & Casualty Co.

"You Take the Wheel,"* 22 minutes, color, Allstate Enterprises.

Resource Materials

The student should know the basic texts, periodicals, and periodicals

BASIC REFERENCES

AEtna Life and Casualty in consultation with Pepyne, Edward W. *Teacher's Manual:* AEtna Drivotrainer System, film sections as follows: "The Drivotrainer System," "Manual Shift Car," and "Automatic Shift Car."

Allstate Insurance Company, Allstate Good Driver Trainer System, film booklet "You Take the Wheel."

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Basic References (Continued)

American Automobile Association. *Practice Driving Guide for Use With Sportsmanlike Driving*, p. 13.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 50-52, 171, 183, 218, 280, 337, 344, 380-383.

Anderson, William G. *In-Car Instruction: Methods and Content.* A Manual for Teachers of Driver and Traffic Safety Education, pp. 107-123; 128-132.

Anderson, William G. *Laboratory Manual for Learning to Drive*, p. 7.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies*, pp. 45-55, 62, 63, 85-86, 91.

Anderson, William G. *Teacher's Manual for Learning to Drive*, pp. 21, 22, 24, 26.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 134; 140-145.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 14-0 - 14.5.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, pp. 26-30.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers*, pp. 21-22.

Quane, W. Laurance. *Utilizing the Multiple Car Driving Range*, pp. 20-23, 38, 40, 75-76.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 210, 215-221, 255-256.

American Automobile Association. *Sportsmanlike Driving: Teacher's Guide*, pp. 29-30.

American Automobile Association. *Teaching Driver and Traffic Safety Education*, pp. 185, 187-190, 194-196, 201-202.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, pp. 27-29.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, pp. 232-236, 241-247.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 69-71, 79. Prentice Hall, Inc., New Jersey, 1962.

Glenn, Harold T. *Youth at the Wheel*, pp. 180-183.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 30-33, 132-139, 170, 175.

Highway Research Board. *Highway Research Record 122: Road User Characteristics*, p. 19, Washington, D.C., 1966.

National Education Association, National Commission on Safety Education. *How Experienced Teachers Develop Good Traffic Citizens: Tips and Cues*, pp. 39-41.

North American Professional Driver Education Association. *The New Driver's Guide.* (Strasser/Aaron), pp. 18-19.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 66-68, 79-81.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. pp. 220-221, 251-252, 256, 270.

Speed Control

The student should be able to maintain precise control of the car's speed through use of the accelerator, brake, and gearshift.

While improper speed is rarely the sole cause of an accident, the faster a car is traveling the greater are the likelihood and severity of a collision in the event other tasks are not adequately performed. The driver must learn to associate various visual, auditory, and kinesthetic motion cues with specific speeds as well as to rely heavily upon his speedometer in remaining within the limits of safe driving.

DRIVING TASK REQUIREMENTS

The student should know the procedures and performances for correct speed control.

The greater the speed, the less time the driver has to react, the greater the impact in a collision, the more severe the injuries and property damage.

Since many of the factors which contribute to accidents–road configuration, weather conditions, other traffic, for example–cannot be removed, the speed of cars must be controlled. This is the responsibility of the drivers.

State laws establish one of two types of speed limits: flexible and fixed. Under a flexible, or prima facie, limit, the allowable speed depends on the configuration and condition of the roadway, traffic and weather conditions, visibility, and other "forces of nature." Under a fixed, or absolute, speed limit, a maximum is set which drivers may not exceed under any conditions. Minimum speed limits as well have been established on many multilane roadways.

Too much speed or too little speed is not necessarily the cause of many accidents, but it is a complicating factor. The driver who goes too fast dodges in and out of traffic, passing and changing lanes; the driver who goes too slowly forces other drivers to pass and change lanes. The result is a speed differential which creates hazardous conditions, which, in turn, too frequently result in accidents.

The safest driving conditions exist when all traffic is moving at about the same rate of speed, and this speed should be geared to existing conditions.

To operate his car at a safe speed, the driver should:

Adjust speed to that of traffic flow.

A recent study by the Bureau of Public Roads indicates the safest speed is usually the average speed of all vehicles on a particular stretch of road. The likelihood of a car being involved in an accident is directly related to its deviation from the average speed of travel, whether it is going faster or slower than other vehicles in traffic.

In a third of the fatal accidents in 1971, speed was a contributing factor.

Periodically check his speed by observing the speedometer, especially when there is a change in the legal limit.

There is a natural tendency to underestimate speed after driving at a high rate of speed for 15 or 20 minutes.

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Avoid fluctuations in speed when not necessitated by traffic situations.

> The driver who frequently drops down to 25-30 miles per hour for no reason and then accelerates to 45-50 miles per hour uses more gasoline than one who drives steadily at 40-50 miles per hour.

The student should know the skills that are necessary for correctly controlling speed.

The driver's ability to judge speed without looking at the speedometer depends upon his skill in observing the movement of objects and of noting kinesthetic perceptions—e.g., road vibration—and auditory perceptions—e.g., rushing air, tire hum, engine noise, and auto body noises. The driver must develop the ability to apply the correct amount of pressure on the accelerator or brake to attain the desired speed as smoothly as possible.

LEARNING PROBLEMS

The student should know the kinds of difficulties that may be experienced in learning to control or adjust the speed of the car.

Accelerator and Brake Pressure

Determining how much pressure to apply to the accelerator and/or brake pedal to effect a minor speed adjustment or to maintain speed may be a problem for the beginning driver, especially one who has lessons in one car and practices in another. Response to pressure on the accelerator or brake will vary from car to car. More powerful cars with or without power brakes generally require less driver effort for acceleration or deceleration than do smaller cars with or without power brakes. The differences in the way the two cars respond may cause a new driver a temporary problem in speed control.

Speed as a Part of Another Driving Task

A new driver may become engrossed in one aspect of the driving task and neglect to give attention to another aspect. For example, the student driver may be so intent on steering when turning on a curve that he relaxes his foot on the accelerator, causing an unnecessary reduction in speed.

Estimating Speed

Experienced drivers appear to be able to detect speed changes of about five miles per hour, and to estimate their rate of speed within five miles. The beginning driver will acquire this skill as he progresses through his training. When, after some experience behind the wheel, he exhibits difficulty in speed control because it appears he has not learned to estimate his speed, the cause may be poor visual, auditory, and kinesthetic perceptiveness.

Common Student Errors

Over-reacting to other vehicles and pedestrians by driving too far to the left or to the right.

Maintaining an inflexible rate of speed (perhaps as a result of practice in off-street areas). This may cause the student to drive too slowly on multilane roadways and too fast on two-lane roadways.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard or traffic situation board	--	--
Charts and/or tables on accident statistics related to speed	--	--
Handouts/pamphlets	National Safety Council	"Too Fast for Conditions" safety brief "Speed, Motor Vehicle" data sheet
Newspaper clipping and magazine articles on the effects and hazards of speed	--	--
Classroom poster on stopping distances and speed	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Fundamental Driving Techniques II,"* 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

"Speed," 7 minutes, b/w, Associated Films, Inc.

"Speed and Reflexes," 11 minutes, b/w, Progressive Pictures.

"Speed Control," 73 frames, b/w, General Motors Corp.

Simulator Films

"ABC's of Parallel Parking,"* 19 minutes, color, AEtna Life & Casualty Co.

"A Drive in a Manual Shift Car,"* 22 minutes, color, AEtna Life & Casualty Co.

"Safe Highway Driving,"* 16 minutes, color, AEtna Life & Casualty Co.

"Shifting Skills,"* 16 minutes, color, AEtna Life & Casualty Co.

"Traffic Strategy,"* 16 minutes, color, AEtna Life & Casualty Co.

"Expressways are Different,"* 24 minutes, color, Allstate Enterprises.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty in consultation with Pepyne, Edward W. ***Teacher's Manual: AEtna Drivotrainer System,*** film sections as follows: "Shifting Skill," "Manual Shift Car," "Highway Driving," "Traffic Strategy," "Parallel Parking," and "The Decision is Yours."

Allstate Insurance Company, ***Allstate Good Driver Trainer System,*** film booklet, "Expressways are Different,"

American Automobile Association. ***Teacher's Handbook for Sportsmanlike Driving,*** pp. 95-97, 116-118, 178.

Anderson, William G. ***In-Car Instruction: Methods and Content—A Manual for Teachers of Driver and Traffic Safety Education,*** pp. 114, 128-132, 163-165.

Anderson, William G. ***Laboratory Manual for Learning to Drive,*** p. 7.

Anderson, William G. ***Learning to Drive: Skills, Concepts, and Strategies,*** pp. 40-41, 51, 62, 63, 85, 91, 103-111.

Anderson, William G. ***Teacher's Manual for Learning to Drive,*** pp. 21-23, 26.

Center for Safety Education, New York University. ***Driver Education and Traffic Safety,*** pp. 33-35, 191.

McKnight, A James and Adam, Bert B. ***Driver Education Task Analysis Volume I: Task Descriptions,*** pp. 15-0 - 15-5.

McKnight, A James and Hundt, Alan G. ***Driver Education Task Analysis, Volume III: Instructional Objectives,*** pp. 32-33.

Malfetti, James L. ***A Description of the Driving Task Adaptable for a Manual for Beginning Drivers,*** pp. 16-21.

SUPPLEMENTARY REFERENCES

U.S. Air Force. *The Safe Driving Handbook,* pp. 52-57, 62-64.

American Automobile Association. *Sportsmanlike Driving: Teacher's Guide,* pp. 27-28.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education,* pp. 30-33.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education,* pp. 139, 215-216, 250-254.

Center for Safety Education, New York University. *Man and the Motor Car,* pp. 196-198, 207.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 175; 181-183; 193.

North American Professional Driver Education Association. *The New Driver's Guide,* pp. 52-53.

Downshifting

The student should be able to shift from higher to lower gears smoothly and safely whenever driving conditions require it.

Maintaining proper speed in a manual shift car on steep grades will frequently require shifting from higher to lower gears, that is, "downshifting." On an uphill grade, downshifting supplies additional accelerative power; on a steep downgrade, it supplies the braking power of engine friction. Downshifting will also keep the car from "bucking" at low speeds.

DRIVING TASK REQUIREMENTS

The student should know the procedures for downshifting.

When to Downshift

Downshifting is frequently necessary in ordinary driving. It provides the engine with braking power on a downgrade, prevents the engine from stalling, and provides more power when climbing hills, turning corners, and driving in heavy traffic or during hazardous conditions.

Downshifting in a Manual Shift Car

When downshifting in a manual shift car, the driver should:

Remove his foot from the accelerator and place his hand on the gearshift lever.

Depress the clutch.

Move the gearshift lever to the next lower gear.

> Downshifting to first gear should be avoided since, in some cars, first gear is not designed to mesh while the car is moving. Downshifting to first gear could damage the gears.
>
> On a steep downgrade, downshifting should be completed before starting down the hill and when the car has decelerated to 15-20 miles per hour.

Depress the accelerator slightly.

Release the clutch gradually.

> If deceleration is too rapid, pressure on the accelerator should be increased.

Release the clutch completely and apply sufficient accelerator pressure to maintain the desired speed.

Downshifting in an Automatic Shift Car

When downshifting in an automatic shift car, the driver should:

Remove his foot from the accelerator.

Speed should be reduced to below 30 miles per hour in an automatic shift car when downshifting from the drive position to the new lower range.

Abrupt downshifting when the car is traveling at a relatively high rate of speed is hard on the car. On slippery surfaces, it can cause the rear wheels to slide.

Depress the accelerator to maintain desired speed.

The student should know the skills necessary for downshifting in a manual shift and automatic shift car.

To downshift in a manual shift car, the driver must develop skill in coordinating the use of the clutch, accelerator, and gearshift lever. He must also know at what speed to downshift and be able to time the procedure.

The normal sequence for downshifting is from third gear to second. The driver must first remove his foot from the accelerator to reduce speed, depress the clutch pedal, and apply pressure to the brake to reduce speed further, to 10-15 miles per hour. (Downshifting at a high rate of speed may produce a skid.) The driver should next apply a slight pressure to the accelerator to increase engine speed, then shift to second gear. He can now release the clutch and accelerate smoothly.

On an uphill grade, downshifting must be completed quickly while the momentum of the car keeps it moving; otherwise, the car will stall.

On a downhill grade, the driver, in either an automatic or manual shift car, must complete downshifting before beginning the descent.

LEARNING PROBLEMS

The student should know the kinds of difficulties that may be experienced in learning to downshift.

Timing the Downshifting Procedure

A beginning driver may have difficulty in timing the downshifting procedure in a manual shift car. If he shifts to a lower gear before the car has decelerated adequately, he may damage the transmission or produce a skid. If he waits too long to downshift, the engine may stall.

Coordinating Control Devices

Additional problems in downshifting in a manual shift car may arise when the beginning driver has difficulty in operating the various control devices simultaneously and/or in the proper sequence—clutch, brake pedal, accelerator, and gearshift lever. The fact that these coordinations are frequently required at the same time the driver is engaged in a maneuver such as turning tends to complicate the problem. If the student is to be taught downshifting in a manual shift car, he should gain a degree of facility in the activity by itself before he attempts to apply it during normal on-street driving.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard or traffic situation board	--	--
Gearshift model	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Downshifting and Emergency Stops," No. 15, Part 1, Driver Education Series, Indiana University.

Simulator Films

"A Drive in a Manual Shift Car,"* 22 minutes, color, AEtna Life & Casualty Co.

"Shift for Yourself,"* 26 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System*, film section, "Manual Shift Car."

Allstate Insurance Company, *Allstate Good Driver Trainer System*, film booklet, "Shift for Yourself."

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, Sixth Edition, pp. 351-352, 359, 360.

Center for Safety Education, New York University *Driver Education and Traffic Safety*, pp. 140, 172.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 16-4 - 16-5.

McKnight, A. James, and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, pp. 34-35.

SUPPLEMENTARY REFERENCES

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, p. 31.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, pp. 252-254.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 76, 195.

Glenn, Harold T. *Youth at the Wheel*, pp. 198-199.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 28, 190, 254-255.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 74, 80, 136.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 219-220.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Stopping

The student should be able to bring the car to a smooth, gradual stop under normal conditions and to maintain control of the vehicle when a rapid stop is required.

When there is ample room, correct stopping is primarily a matter of warning vehicles behind and exercising sufficiently precise control of the brake. However, where the car must be stopped quickly, the driver must avoid locking the wheels, causing a skid, and losing directional control.

DRIVING TASK REQUIREMENTS

The student should know the procedures as well as applicable laws, that pertain to stopping a car.

Factors Affecting Stopping

Several factors influence the distance needed to bring a car to a safe, comfortable stop condition of the brakes and tires, condition of the roadway, and the speed of the car. Under the best conditions, a driver requires these distances to stop safely after the brakes have been applied:

2 to 3 car lengths at 20 miles per hour.
7 to 9 car lengths at 40 miles per hour.
15 to 17 car lengths at 60 miles per hour.

Greater distances are required when the car's brakes are faulty or the tires worn, on downgrades and slippery road surfaces.

Power brakes do not reduce the distance required for stopping; they merely require less effort by the driver.

Stopping Procedures

Before stopping, the driver should:

Check the rearview mirror for following traffic.

Signal following traffic.

Activating the brake lights by depressing the brake pedal slightly with either foot will warn following vehicles that the driver is preparing to stop.

The hand signal for slowing down and stopping should also be given, if possible. (The driver extends his hand and arm downward out the window.) This signal is advantageous in heavy traffic when taillights may not be visible. In some states the signal is required by law.

Begin to slow down well before the point at which he wishes to stop.

Beginning to brake well in advance allows a controlled, more comfortable stop.

In estimating his stopping distance, allow a safety margin with the vehicle ahead.

Depress the brake gradually.

Either foot can be used for braking, although right-foot braking is more common.

Left-foot braking reduces slightly the time required to apply the brake. However, in an emergency left-foot braking has been known to result in simultaneous application of brake and accelerator. Leaving the left foot on the brake pedal may lead to "riding" the brake. In addition to creating wear on the brake linings, riding the brake causes the brake lights to go on, confusing following drivers who anticipate a slowing or stopping.

Right-foot braking separates accelerator and brake pedal application, reducing the chance that both would be applied simultaneously in an emergency, particularly with a beginning driver. (Many one-car accidents are caused by the driver inadvertently accelerating rather than braking.)

Applying the brake before depressing the clutch in a manual shift car allows engine braking with foot braking. However, the clutch must be depressed before the car comes to a stop to prevent the engine from stalling.

Easing up on the brake pedal just before coming to a full stop avoids a jolting stop.

Shifting into neutral when a prolonged stop is anticipated eliminates the possibility that the car will lurch forward if the foot slips off the clutch.

Rapid Stops

When it is necessary to make a rapid stop or emergency stop, the driver should:

Signal the traffic behind, if time permits, by flashing the brake lights.

On dry pavement, apply the brake firmly and evenly when the stopping distance is not limited, or in a series of short jabs when stopping distance is limited.

Stopping on a Hill

When it is necessary to come to a stop on a hill, the driver should:

Allow extra headway between the car and the vehicle ahead.

Apply the parking brake in a manual shift car.

The student should know the skills that are necessary for correct execution of the stopping maneuver.

The beginning driver must develop the skill of gradual braking in order to stop the car at a designated place. This means that he must acquire the perceptual skill of judging how much stopping distance is required on the basis of the speed he is traveling. Required stopping distance must be translated into terms of braking—the point at which to apply the brakes and how much pressure to apply for a smooth, comfortable stop.

He must also have the skill to come to a rapid or emergency stop, when the occasion demands it, while providing maximum safety to himself, his passengers, and other drivers and pedestrians. In learning to brake quickly, the new driver must develop the ability to move his foot from the accelerator to the brake and depress the brake pedal firmly. He must also be able to make a judgment as to whether the situation requires quick braking or maximum braking. If the latter is necessary, the driver must determine how much force he can apply to the brake without locking the wheels and putting the car in a skid. (See Skid Control.) He must also be skilled in "pumping" the brakes for a rapid stop on a slippery surface and in "jabbing" the brakes for a rapid stop on a dry surface.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to bring the car to a normal or rapid stop.

When to Start Braking

A beginning driver may have difficulty knowing when to start braking. He may brake too soon, which causes the car to stop too gradually or before it reaches the predetermined position. Or he may brake too late which causes an abrupt, uncomfortable stop and puts stress on the car.

Stopping Gradually

A beginning driver will have difficulty bringing the car to a smooth, gradual stop, particularly if the car is equipped with power brakes. To brake gradually, a driver must be aware of the effects produced by slight application of pressure on the brake pedal. The inexperienced driver, not yet aware of this, tends to apply more than the necessary amount of pressure on the pedal. As a result the car comes to an abrupt, jerky stop.

A new driver might expect the car to begin slowing down the moment he applies pressure to the brake pedal. He should know that this is not usually the case, that most brake pedals must be depressed slightly before the brake takes hold. When the car does not slow down immediately after he depresses the brake pedal, an inexperienced driver may apply more pressure, which causes an abrupt braking effect.

Stopping Quickly

A beginning driver, having been taught to brake gradually so that the car will stop smoothly, may have difficulty with quick braking, not only in learning how to brake quickly for a rapid or emergency stop without locking the wheels, but in justifying the need for this kind of stop. He may be reluctant to brake firmly and rapidly because it is uncomfortable for him and his passengers and can be dangerous if they do not have their seat belts fastened. However, many occasions require a driver to stop quickly in order to avoid an accident. For this reason, the student should acquire skill and confidence in making quick stops before driving in traffic.

Space Required for Car When Stopped

A new driver may fail to consider how much space the car will need when it is stopped. The space he selects for stopping may not be large enough to accommodate the car. This can impede the flow of traffic and create hazardous conditions for other drivers.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Gyro-ball or similar device to indicate excessively abrupt stops.	–	–
Chalkboard or traffic situation board	–	–
Classroom poster on stopping distances	–	–
Handouts/Pamphlets	American Automobile Assoc.	"Stopping Distance Fundamentals"
	National Safety Council	"Bad Brakes Kill" fact sheet

FILMS/FILMSTRIPS/SLIDES

Normal Stopping/Stopping Distance and Time

Classroom Visual Aids

"Don't Be a Sitting Duck," No. 2, Defensive Driving Film Series, 10 minutes, b/w, Association Films, Inc.

"Fundamental Driving Techniques II,"* 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

"Reaction, Braking and Stopping Distances," 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

"Speed and Reflexes,"* 11 minutes, b/w, Progressive Pictures.

Simulator Films

"Blending in Traffic,"* 20 minutes, color, AEtna Life & Casualty Co.

"A Drive in an Automatic Shift Car,"* 20 minutes, color, AEtna Life & Casualty Co.

"Shifting Skill,"* 16 minutes, color, AEtna Life & Casualty Co.

"Traffic Strategy,"* 16 minutes, color, AEtna Life & Casualty Co.

"You and the AEtna Drivotrainer,"* 20 minutes, color, AEtna Life & Casualty Co.

"Drive in Review,"* 27 minutes, color, Allstate Enterprises.

"You Take the Wheel,"* 22 minutes, color, Allstate Enterprises.

Rapid Stopping

Classroom Visual Aids

"Emergency Braking Procedures," 48 frames, color, Ford Motor Company.

"The Next Few Seconds," 10 minutes, color, National Safety Council.

Simulator Films

"Crash Avoidance,"* AEtna Life & Casualty Co.

"Decision is Yours," AEtna Life & Casualty Co.

"Traffic Strategy,"* 16 minutes, color, AEtna Life & Casualty Co.

*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System*, film sections as follows: "The Drivotrainer System," "Shifting Skill," "Automatic Shift Car," "Blending in Traffic," and "Traffic Strategy."

Allstate Insurance Company, Allstate Good Driver Trainer System - Film booklets as follows: *You Take the Wheel* and *Drive in Review*.

American Automobile Association, *Teacher's Handbook for Sportsmanlike Driving*, Sixth Edition, pp. 83, 87-88, 94-104, 347, 349-351, 356, 358.

Anderson, William G. *In-Car Instruction: Methods and Content*, pp. 102-107, 123-132, 257-259.

Anderson, William G. *Laboratory Manual for Learning to Drive*, p. 7.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies*, pp. 41-45, 56-63, 224-225.

Anderson, William G. *Teacher's Manual for Learning to Drive*, pp. 21-23, 25, 26, 56, 59.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 132-133, 146, 177-183.

McKnight, A.J., and Adams, B.B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 16-0 - 16-6.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, pp. 36-38.

Quane, W. Laurance, *Utilizing the Multiple Car Driving Range*, pp. 7, 25-26, 63.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 218-219, 261.

U.S. Air Force. *The Safe Driving Handbook*, pp. 48-52, 58-62.

American Automobile Association, *Teaching Driver and Traffic Safety Education*, pp. 185, 195-199, 201, 375-376.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, pp. 244, 246, 251-254.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 68, 84, 85, 87, 182-184, 190-195, 202, 203.

Glenn, Harold T. *Youth at the Wheel*, pp. 72-78, 146, 175.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 25, 27, 29.

Johnson, Duane R. "Which Foot for Braking," *Journal of Traffic Safety Education*, Vol. XVIII, No. 4.

Moseley, Alfred L. "Steering vs. Braking," *Concepts/For Traffic Safety*, pp. 7-8.

North American Professional Driver Education Association, *The New Driver's Guide* (Strasser/Aaron), pp. 16-17.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 21-22, 83-84, 158, 201.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 150-159, 216-217.

Backing

The student should be able to control speed and direction and maintain sufficient rearward visibility to back the car safely.

The limitations in rearward visibility make backing an inherently dangerous maneuver and something to be avoided wherever possible. However, several situations, such as parallel parking, require the ability to back the car. Appropriate body position and proper coordination of accelerator, brake, and clutch will minimize the dangers involved in backing.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws pertaining to backing a car.

Backing Restrictions

Backing should be avoided whenever it places the car in opposition to the flow of traffic.

All states prohibit backing on freeways. Many states prohibit backing whenever it may interfere with other traffic.

In general it is best to avoid backing onto a roadway. If space limitations prevent turning around, the car should be backed off of the roadway in order that it can enter "head first."

A significant number of accidents result from improper backing, particularly accidents that occur on parking lots and when leaving parking spaces.

Before putting the car in motion, the driver should:

Check behind the car for vehicles and pedestrians that are in the car's path or about to enter it and for obstructions that may be in the car's path.

Look over both shoulders.

The use of mirrors leaves too many "blind spots."

A survey of backing accidents revealed that over half resulted from failure to check to the rear before backing.

Approaching drivers and pedestrians generally do not expect a car to back up, and they may enter the car's path while the driver is preparing to back up.

Shift into reverse gear, when the path behind is clear, and after placing the right foot on the brake pedal and releasing the parking brake.

In a manual shift car, shifting is accomplished by depressing the clutch and placing the gearshift lever in reverse gear.

In an automatic shift car, shifting is accomplished by depressing the brake and placing the selector lever in the "R" position. It may be necessary to lift the selector lever upward in order to shift.

Turn the upper body to face the right side of the car, the head to look out the rear window.

Looking directly back through the rear window will reduce the chances of overlooking vehicles or pedestrians approaching from either side.

Putting the head out the left side window will give a good view of the left side of the car but will render the driver completely blind to anything directly behind or approaching from the right.

Opening the car door is no better than looking out the left window and may, in addition, cause injury to the driver or damage to the car.

Place the left hand at the top of the steering wheel and the right hand on the back of the right seat back.

Backing Up

In backing a manual shift car the driver should:

Remove his right foot from the brake.

Release the clutch slowly to the friction point.

The use of the clutch pedal allows the car to be backed at the slow "idle" speed.

Short or precise backward maneuvers may be made by pressing and releasing the clutch.

For backing over longer distances, the clutch pedal can be released and speed may be regulated by depressing the accelerator.

In this case it is desirable to keep the left foot on the clutch in case it is necessary to stop suddenly.

Use of the accelerator requires extremely precise control and could produce sudden, accidental accelerations.

In backing an automatic shift car, the driver should:

Remove his foot from the brake.

Short or precise backward maneuvers may be made by depressing and releasing the brake pedal to control speed. This accomplishes the same thing as regulation of the clutch pedal in a manual shift car.

For backing over longer distances, speed may be controlled by accelerator pressure.

In steering while backing the driver should:

Maintain a firm grip on the top of the steering wheel.

Grasping the top of the steering wheel gives the most control with the least effort.

Turn the top of the steering wheel to the side the rear of the car is to move.

Avoid any quick steering corrections.

Abrupt steering corrections can produce violent turning motions in the automobile causing the operator to lose control.

Turn in the following manner:

Drive more slowly than when turning in a forward direction, for the reasons just described.

Move the body somewhat in order to see in the direction of the turn.

If the rear of the car is turning toward the right side, the driver should remain generally in the position described at the outset.

If the rear of the car is turning toward the left side, the driver should turn around in order to look over the left shoulder.

Stopping in Reverse

Stopping the car while in reverse is essentially the same process as stopping in a forward direction. However, the design of some brake systems results in reduced efficiency when the car is backing up. For that reason the driver should anticipate:

The need for somewhat greater brake pressure.

A somewhat greater stopping distance than when traveling forward at the same speed.

The car should be stopped completely before any attempt is made to shift into forward gear.

The student should know the skills required for the backing maneuver.

Assuming that the driver has acquired the skills necessary to control motion of the car in a forward direction, the skills needed in backing are primarily learning to associate a rearward path with appropriate steering wheel manipulations. Steering characteristics for forward motion of an automobile differ considerably from those for rearward motion. The driver must learn to associate differences between actual and intended path angle with the direction in which the steering wheel is turned as well as the rate of turn.

The car's accelerative and braking characteristics for forward motion differ from rearward motion also, and the driver must also learn to associate perceptions of motion and distance with different accelerator, brake, and clutch pressures.

LEARNING PROBLEMS

The student should know difficulties that may be experienced in learning to back the car.

Speed Control

The beginning driver often backs his car at too great a speed. The reason he does this may be because he cannot exercise adequate control over the clutch, accelerator, and brake. Turning his body too far in order to look backward makes it difficult to reach the brake pedal. In addition, he may be attempting to control the speed of the car with the accelerator pedal rather than with the brake pedal.

Steering Corrections

Knowing which way to turn the steering wheel in order to back the car in a specific direction is a common problem with a beginning driver. He will realize that the car is not backing on a straight path, but the steering correction he makes may be in the wrong direction, thus doubling the distance he is off course.

Using Mirrors

Using mirrors to back up instead of turning around to look through the rear window can become a serious problem if the beginning driver is permitted to continue this habit.

Centering the Car in the Backward Path

A beginning driver may restrict his attention to one of the rear fenders in gauging the backward path of the car, when he should watch the entire rear end of the car and keep the car itself centered in the path. Restricting his focus in this manner may prevent the driver from seeing potential hazards in other areas near the car. Moreover, he will tend to steer the car in the direction of his gaze and thus veer away from the intended path.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard or traffic situation board	--	--
Chalkboard or traffic situation board for in-car use	--	--
Handouts/pamphlets	National Safety Council	"Backing Rite" safety brief; "Better Backing" safety brief; "Look, Stop Backing Accidents"

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Backing the Car," 8 mm, 3-4 minutes, color, Charles Cahill Associates, Inc.

"Basic Maneuvers I,"* 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

"Fundamental Driving Techniques II,"* 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

"Better Backing," 30 2x2 slides, color, w/script, National Safety Council.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Simulator Films

"Backing Safely," 17 minutes, color, AEtna Life & Casualty Co.

"A Drive in a Manual Shift Car,"* 20 minutes, color, AEtna Life & Casualty Co.

"Special Maneuvers,"* 28½ minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System*, film sections as follows: "Manual Shift Car," and "Backing Safely."

Allstate Insurance Company. *Allstate Good Driver Trainer System*, film booklet, "Special Maneuvers."

American Automobile Association. *Practice Driving Guide for Use with Sportsmanlike Driving*, Sixth Edition, pp. 15-16.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, Sixth Edition, pp. 176-177, 192, 386-388.

Anderson, William G. *In-Car Instruction: Methods and Content—A Manual for Teachers of Driver and Traffic Safety Education*, pp. 133-152, 222-236.

Anderson, William G. *Laboratory Manual for Learning to Drive*, pp. 9, 21.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies*, pp. 64-78, 152-158, 160.

Anderson, William G. *Teacher's Manual for Learning to Drive*, pp. 26-28, 44-46.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 133-135.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 17-0 - 17-4.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, pp. 40-42.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers*, pp. 41-44.

Quane, W. Laurance. *Utilizing the Multiple Car Driving Range*, pp. 11, 13-14, 16, 29, 31, 33, 69.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 221-223.

American Automobile Association. *Sportsmanlike Driving: Teacher's Guide*, pp. 27-28.

American Automobile Association. *Teaching Driver and Traffic Safety Education*, pp. 185-187, 196, 236-237.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, pp. 232-236, 241-247.

Center for Safety Education, New York University. *Man and the Motor Car*, p. 70

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 34-35, 40-41.

North American Professional Driver Education Association. *The New Driver's Guide*, p. 20.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 82-84.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 217-218.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Turnabouts

The student should be certain of the legality, and be aware of the hazards, of making a U-turn, three-point turn, and two-point turn.

Uncertainty as to the legality of a turnabout, particularly of a U-turn, and the risk of endangering and/or impeding traffic may cause the driver to feel that "going around the block" may be the best and safest way to reverse the direction of the car. Making a U-turn at an intersection is regarded as potentially hazardous—a fact which has resulted in a recommendation to limit U-turns to the middle of the block.

DRIVING TASK REQUIREMENTS

The student should know the procedures for correctly making a U-turn, a three-point (Y) turn, and a two-point turn.

Turnabouts, which reverse the direction of the car, are of three types: U-turn, two-point turn, and three-point, or Y, turn. The U-turn is fairly complex because the driver must select the proper location and estimate whether there is enough room for the turn. He must maintain precise control of the car, coordinating speed and steering to make a smooth turn within the roadway boundaries. Three-point and two-point turns, although not particularly difficult, require the driver to recheck traffic to the front and rear prior and during the turn. Failure to perform any of these turns correctly may cause an accident and/or impede traffic.

U-Turns

The U-turn does not require the driver to back up or to make several successive turns in order to reverse the direction of the car. Rather, it enables the driver to turn around in one continuous movement. In making a U-turn the driver should:

Select the proper location, away from intersections, hills, curves, and other areas of potential conflict.

Check for oncoming and rear-approaching traffic, waiting until the roadway is clear before beginning the turn.

Turn on the left-turn signal before beginning the turn.

In a manual shift car, shift into first gear before beginning the turn.

Accelerate slowly while starting the turn and steer the car into the right-hand lane, with a rapid turn of the wheel.

> Use the hand-over-hand technique to turn the steering wheel.
>
> After completing the turn, check traffic to the rear, then straighten the front wheels and accelerate to merge into the traffic pattern.

When making a U-turn in the middle of the block on a wide street, the driver should:

Select a location far enough from the intersection *to avoid impeding traffic*.

Position the car close to the right-hand curb before initiating the turn.

When making a U-turn at urban intersections or on divided highways, the driver should:

Position the car in the lane nearest the center of the roadway, as though preparing for a left turn.

Stop and scan the intersection for possible hazards.

Move slowly toward the center of the intersection.

Turn left sharply as the front wheels enter the middle of the intersection.

When making a U-turn on a residential or narrow street intersection, the driver should:

Veer to the right before turning sharply to the left.

Steer toward the opposite side of the cross street (far left curb corner) for continuous turning movement.

Pull back onto the roadway.

Three-Point (Y) Turns

A three-point turn is usually made on streets too narrow for a U-turn. This maneuver requires the driver to turn left, back up, and move forward. Because of the time it takes to execute a three-point turn and because of the hazards involved, this turnabout is used less than the U-turn or two-point turn.

In making a three-point turn the driver should:

Stop at the curb, checking for traffic from both directions.

Accelerate slowly and turn the steering wheel sharply to the left.

Turn the steering wheel sharply to the right just before reaching the opposite curb, and stop in advance of the curb. (The sidewalk generally disappears from the driver's view as the wheel reaches the curb.)

Check traffic, and back toward the opposite side of the street, turning the wheel sharply to the right.

Turn the wheels left and stop before reaching the curb.

Check traffic in both directions.

Shift back to drive or first gear, accelerate, and steer into the proper lane.

Two-Point Turns

When making a two-point turn using a driveway the driver should:

Drive past the driveway on the right side of the road (about a half car width from the curb), and then back into it. Moving forward into the driveway and backing into traffic should be avoided because of the hazards involved.

Check for traffic to the left and right and turn left into the roadway when it is safe to do so.

The student should know the skills required for making the type of turn that reverses the direction of the car.

The driver must be able to judge whether there is enough room to make a U-turn. Inability to make this judgment will often result in driving onto the curb before completing the turn.

The driver must also be able to coordinate steering with speed control so that he can complete the turn without impeding traffic and without making too wide a turn. Wide U-turns are caused by too much speed for the amount of steering adjustments being made.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to make U-turns.

Selecting the Correct Turn

A beginning driver may experience some difficulty in deciding, with existing conditions, which is the best turn for reversing the direction of the car. His judgment should be based primarily on road configuration, traffic conditions, and available time. Until he acquires some experience in driving a car he will have some difficulty in determining the turning radius of the car. This will affect his decision on the type of turnabout to make. In most cars, two clear lanes are required to complete the turn.

Estimating Available Room for Turn

A student driver may have difficulty in judging whether there is enough room to make the U-turn—whether the street is broad enough or whether the intersection will permit a full circle. Not knowing the turning radius of the car and a lack of experience in perceptual judgment will contribute to this problem.

Coordinating Speed and Steering

A beginning driver may attempt to make the turn at too great a speed for the amount of steering adjustments he makes. The turn should be made slowly to permit the driver to control the turn.

The student should know the kinds of difficulties that may be experienced in learning to make three-point and two-point turns.

Over-Concentration on One Activity

A student driver may become so intent on surveillance and steering activities he forgets to move the gearshift to the proper position. This can delay completion of the turn and impede traffic.

Obstructing Traffic

The inexperienced driver frequently takes too long a time to complete three-point or two-point turns. Although traffic may have been clear when he began the maneuver, his attempts to be careful and thorough result in the maneuver taking a long period of time and traffic being impeded.

Other Common Problems

Striking the curb when backing for a three-point turn. This problem may be attributable to the fact that the beginning driver may not realize that tires are positioned approximately four feet from the front and rear of the car. Underestimating the overhang often leads to striking hydrants, light poles, etc.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	--	--
Chalkboard or traffic situation board for in-car use	--	--
State driver's manual	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Basic Maneuvers I,"* (Three-point and two-point turns only.), 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska

Simulator Films

"Angle Parking and Turning Maneuvers,"* 18 minutes, color, AEtna Life & Casualty Co.

"Road Check," (3 point turn only), 20 minutes, color AEtna Life & Casualty Co.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide materials for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System*, film sections "Angle Park-Turning Maneuver," and "Road Check."

American Automobile Association. *Practice Driving Guide for Use with Sportsmanlike Driving*, p. 17.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, Sixth Edition, pp. 203-204, 388-389.

Anderson, William G. *Laboratory Manual for Learning to Drive*, p. 23.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Basic References (Continued)

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies*, pp. 161-170.

Anderson, William G. *Teacher's Manual for Learning to Drive*, pp. 46-48.

Center for Safety Education, New York University, *Driver Education and Traffic Safety*, pp. 148-151.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 47-0 - 47.5.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, pp. 164-169

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers*, pp. 44-46.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 224-226.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, pp. 232-236, 257-259.

Center for Safety Education, New York University, *Man and the Motor Car*, pp. 87-91.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 36-37.

North American Professional Driver Education Association. *The New Driver's Guide*, pp. 42-45.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 85-86.

Part III-B

Driving Procedures

The student should know the procedures required for safe and effective automobile operation.

Each of the control maneuvers described in the preceding section, when performed on streets and highways, is capable of creating a hazard to safety and interruption of traffic flow. A number of procedures for carrying out maneuvers in such a way as to maximize safety and traffic flow have been established. These procedures may be conveniently classified according to the types of situations giving rise to them:

General Procedures—Procedures that are performed continuously or periodically during driving—e.g., surveillance, freeway driving.

Normal Driving Situations—Procedures for dealing with normal roadway, traffic, and environmental conditions—e.g., passing, parking, lane changing.

Adverse Driving Conditions—Procedures for dealing with potentially hazardous driving conditions—e.g., snow-packed roadway, limited visibility.

Night Driving—Procedures for dealing with normal driving situations under nighttime conditions.

Special Conditions—Procedures for dealing with a variety of special situations—e.g., towing a trailer, on-road breakdowns.

The manner in which the driver responds to these situations and conditions will greatly influence the probability of his having an accident. However, there is more to driving than simply responding to specific situations. The driver must also attempt, as much as possible, to anticipate potentially hazardous situations—if not to prevent them, then at least to provide himself with as much time as possible to respond to them when they do arise.

III-B-1

General Procedures

Surveillance

Urban Driving

Highway Driving

Freeway Driving

Surveillance

The student should exercise continual surveillance over conditions outside and inside the car.

The early and positive detection of potential hazards requires continual surveillance of traffic and roadway conditions as well as surveillance of displays and other indications of the car's operating condition. The most prevalent cause of accidents is failure to remain alert to the ever changing nature of the driving environment and in that way to detect potential dangers while there is still sufficient time to respond.

DRIVING TASK REQUIREMENTS

The student should know the procedures that pertain to surveillance techniques while driving a car.

General Visual Surveillance

The driver's central vision should provide a clear view of the roadway and surroundings ahead, while his peripheral vision should help him detect obstacles, vehicles, and pedestrians to the sides. When attempting to observe the total driving environment the driver should, in general:

Continuously scan the surroundings on and off the roadway, shifting his gaze at least every few seconds and avoiding the tendency to fixate on the roadway surface immediately in the front of the car.

> Seeking visual information from other areas than in front of the car must become a habit.
>
> Experienced drivers generally spend more time scanning off road areas than do less experienced drivers.

Look well ahead in the lane.

> In urban areas, sight distance should extend one full block ahead.
>
> In rural areas the viewed area should be increased to about one half mile.
>
> With an increase in speed, sight distance should be extended because clear peripheral vision is impossible. The images move faster than the eye movement can compensate. Looking farther ahead compensates for the speed effects on vision.

Auditory

Although the majority of surveillance activities involves the use of the eyes, the driver's auditory senses also can aid him in detecting and/or avoiding potential hazards. When hearing unusual sounds such as sirens, horns, whistles and screeching tires, the driver should:

Look in the direction from which the sound comes and attempt to identify its source.

Use the mirrors to locate the source if the sound is coming from the rear.

Turn down the radio volume and open the window to determine whether the noise is continuous or intermittent and whether the source appears to be approaching or leaving the area.

A loud radio or the driver's inattention/misinterpretation of traffic sounds frequently results in a late reaction to auditory clues of a hazardous situation.

Accident statistics compiled by the National Safety Council indicate that in a recent year, about 12,000 accidents occurred involving emergency vehicles. The majority of these accidents were due to the failure of drivers to hear warning signals.

Respond to unusual sounds caused by the car itself (see "Symptoms of Car Malfunctions").

Olfactory

Odors can help the driver exercise his surveillance procedures. When he detects an odor, he should:

Determine whether a car malfunction may be causing the odor.

A check of the temperature gauge, ash tray, and parking brake should be made immediately. If the smell persists, the car should be pulled off the roadway, and a check made inside the car, under the hood, and of the wheels.

Traffic Surveillance

In observing other traffic, the driver should:

Avoid fixing his attention on any one situation, but respond promptly to each situation.

If the habit of eye movement is not developed, the driver's vision may freeze on one traffic conflict while another conflict exists but is unnoticed by the driver.

Observe traffic ahead, including both parked and moving vehicles, pedestrians, and other road users that may be obscured by larger vehicles.

Accidents frequently occur because the driver fails to note a single parked vehicle in an otherwise clear stretch of curbside parking area.

Check traffic behind by frequently glancing through the mirror(s).

Observe traffic at the side, including vehicles in adjacent lanes moving in the same direction, and vehicles approaching from cross streets.

Beginning drivers tend to use their mirror(s) much less often than experienced drivers.

Watch other drivers for hazardous behaviors, such as changing lanes frequently, failing to signal before a maneuver, stopping abruptly, and changing rate of speed frequently.

Drivers who frequently stop suddenly may be doing so because they are compensating for a slow reaction time. Such drivers subject themselves to rear end collisions.

Surveillance of Traffic Controls

The driver should:

Observe all official road signs which provide warnings, information, and/or regulations.

Major changes in highway and street traffic signs and pavement markings are being made which emphasize an international-type system of pictures and symbolic signs rather than messages. The new traffic control devices provide almost instant communication with the driver without having to be read. Color is significant. Red, of course, indicates stop or prohibition, green shows movement permitted or gives directional guidance, blue is for signs leading to motorist services; yellow indicates a general warning; black on white indicates regulatory signs, such as those for speed limits; orange conveys construction and maintenance warnings; and brown is for public recreation and scenic guidance.

Shape is also significant. Diamond-shaped signs signify a warning; rectangular signs with the longer dimension vertically provide a traffic regulation; and rectangular signs with the long dimension horizontally contain guidance information. An octagon means stop; an inverted triangle means yield; a pennant means no passing; a pentagon shows the presence of a school; and a circle warns of a railroad crossing.

Observe traffic lights well in advance of reaching them and attempt to anticipate light changes, particularly in urban areas where traffic lights control several successive intersections.

By failing to observe the light pattern, the driver may be forced to stop suddenly, creating the hazard of a rear end collision.

Observe pavement markings which regulate passing or lane changing and designate lane restrictions.

Changes are taking place also in the use of pavement markings. Yellow will be used much more than in the past. Yellow lines will delineate the separation of traffic flow in opposing directions. The center line on two-way roadways will be dashed yellow to differentiate from the dashed white lines used on multilane one-way roadways. This will warn drivers who leave one-way roadways that traffic will be opposing them to the left of the yellow line. Other uses of yellow will include occasional left edgelines on divided roadways where traffic canno. pull entirely off the roadway, and for the marking of obstructions and islands which must be passed on the right.

Car Surveillance

To keep informed on operating status at all times the driver should check the instrument panel. In doing so he should:

Monitor the speedometer to determine how fast he is driving.

Check the fuel gauge to determine the approximate amount of gasoline in the fuel tank.

Monitor the temperature gauge for signs that the car is overheating.

Observe the oil pressure gauge for signs of abnormal pressure.

This instrument indicates the pressure at which oil is being pumped to the moving parts of the engine. The needle on the gauge should be at the center of the scale when the engine is warm and the car is moving at normal speed.

With a light as the pressure gauge, pressure is assumed normal when the light is off.

Observe ammeter to see if the battery is discharging or being charged.

The ammeter indicates the number of amps of electricity being sent to or withdrawn from the battery.

Some cars have a generator charge light which, if on when the engine is running rapidly, indicates the battery is discharging.

A malfunctioning battery or voltage regulator will cause the battery to discharge.

(Appropriate responses to abnormal conditions are described in "Symptoms of Car Malfunctions.")

The driver should also react to anything he sees inside the car that would adversely affect driving performance. In doing so, he should:

Ventilate the car's interior when necessary because of heat or cigarette smoke. Adjust the temperature control to a comfortable level.

Avoid being distracted by passenger conversation or activity, particularly when in heavy traffic.

If he talks with passengers while driving in traffic the driver should continue to keep his eyes on the roadway.

Of one-car accidents, 10 percent resulted from passenger distractions.

The student should know the skills necessary for maintaining surveillance of the driving environment.

The driver must be able to scan the driving environment in all directions for situations and objects that might create unsafe driving conditions.

He must develop the ability to look well ahead of the car as well as to the sides, avoiding too much attention to the point directly in front of the car.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to survey the driving environment for potential hazards.

Constant Eye Movement

The beginning driver, not yet having an appreciation for the potential hazards in the environment, may concentrate his vision and attention on a particular object within the environment, or even on one of the car's instruments—the speedometer, for example. In doing so, he may fail to see potential hazards. The instructor should emphasize the importance of constant eye movement, which should include brief glances in the mirrors, in order to scan the total environment.

Looking Well Ahead

A general rule for checking the driving environment for potential hazards is to look well ahead on the roadway and to the sides. A beginning driver, however, tends to focus on a point immediately in front of the car. This can create steering problems and can cause the driver not to notice a condition that is, or might become, hazardous. How far ahead of the car the driver should look depends largely on the speed of the car—but far enough ahead to have time to make necessary steering corrections.

Other Common Problems

Failure to check to the side and rear when changing lanes.
Infrequent use of mirrors.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--
Handouts/pamphlets	Ford Motor Company	"The Eyes Have It"
	National Safety Council	"Test Your See Power" "Watch Out for the Other Guy"
Instructor's inside and outside rear view mirror for in-car use	--	--
A mirror to check student eye movement.	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Aim High in Steering," No. 1 Expert Seeing Series, 10 minutes, b/w or color, National Safety Council.

"Get the Big Picture," No. 2, Expert Seeing Series, 10 minutes, b/w or color, National Safety Council.

"Keep Your Eyes Moving," No. 3, Expert Seeing Series, 10 minutes, b/w or color, National Safety Council.

"SEE-THINK-DO," 30 2×2 slides, color, National Safety Council.

"Test Your See Power," 30 2×2 slides, w/script, National Safety Council.

"Advanced Driving,"* 30 minutes, South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

"The Eyes of the Driver,"* 30 minutes, South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

"Defensive Driving: Are You Warm to the Touch?" 15 minutes, color, Canadian Highway Safety Council.

"Defensive Driving Tactics," 12 minutes, color, Charles Cahill Associates, Inc.

"Drive Defensively," 8 minutes, b/w or color, Keystone Automobile Dept.

"Perception of Driving Hazards, Part I,"* filmstrip, 30 frames, color, Shell Oil Company.

"Perception of Driving Hazards, Part II,"* filmstrip, color, Shell Oil Company.

"Perception of Driving Hazards, Part III,"* filmstrip, color, Shell Oil Company.

"Seeing Habits for Expert Drivers," filmstrip, Ford Motor Co.

"The Smith System of Safe Driving," 8 minutes, b/w, Ford Motor Company.

"Smith System of Space Cushion Driving," 20 minutes, color, Ford Motor Company.

Simulator Films

"Complex Traffic," 24 minutes, color, Allstate Enterprises.

"Drive in Review," 27 minutes, color, Allstate Enterprises.

"Moderate Traffic,"* 26 minutes, color, Allstate Enterprises.

"Perceptive Driving,"* 23 minutes, color, Allstate Enterprises.

"You Take the Wheel," 22 minutes, color, Allstate Enterprises.

"Crash Avoidance," color, AEtna Life & Casualty Co.

"The Decision is Yours," color, AEtna Life & Casualty Co.

"Expressway Excellence,"* 17 minutes, color, AEtna Life & Casualty Co.

"IPDE," color,* AEtna Life & Casualty Co.

"Road Check,"* 20 minutes, color, AEtna Life & Casualty Co.

"Safe Highway Driving," 16 minutes, color, AEtna Life & Casualty Co.

"Separating and Compromising Risks," color, AEtna Life & Casualty Co.

"Traffic Strategy," 16 minutes, color, AEtna Life & Casualty Co.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, reports, and other written materials available for developing lesson plans.

BASIC REFERENCES

AEtna Life and Casualty in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System* - Film sections as follows: "Highway Driving," "Traffic Strategy," "Expressway Excellence," "Road Check," "IPDE," "Separating and Compromising Risks," "Decision is Yours," and "Crash Avoidance."

Allstate Insurance Company. *Allstate Good Driver Trainer System* - Film booklets as follows: "You Take the Wheel," "Perceptive Driving," "Moderate Traffic," "Complex Traffic" and "Drive in Review."

American Automobile Association. *Practice Driving Guide for Use with Sportsmanlike Driving,* Sixth Edition, p. 26.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* Sixth Edition, pp. 50-52, 184-186.

Anderson, William G. *In-Car Instruction: Methods and Content—A Manual for Teachers of Driver and Traffic Safety Education,* pp. 51, 69, 138-139, 159-161, 179-182, 186, 197, 206-207, 225-227, 231.

Anderson, William G. *Laboratory Manual for Learning to Drive,* p. 13.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies,* pp. 92-120.

Anderson, William G. *Teacher's Manual for Learning to Drive,* pp. 29-35.

Center for Safety Education, New York University *Driver Education and Traffic Safety,* pp. 10, 119-120, 191, 197, 208-212, 339.

McKnight, A.J., and Adams, B.B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 21-0 - 21-5.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives,* pp. 46-49.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers,* pp.6-14.

U.S. Department of Transportation, Federal Highway Administration. *The New Look in Traffic Signs and Markings.*

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods, and Organization,* pp. 208-212, 226-227, 262-263.

American Automobile Association. *Sportsmanlike Driving: Teacher's Guide,* pp. 9-10, 33-34.

American Automobile Association. *Teaching Driver and Traffic Safety Education,* pp. 186-187, 196-197, 399-401.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education,* pp. 38-44.

Center for Safety Education, New York University. *Man and the Motor Car,* pp. 104, 202-203, 284, 287-297.

Glenn, Harold T. *Youth at the Wheel,* pp. 258-264, 295-301.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Driver Right,* pp. 78-88, 228-229.

National Education Association, National Commission on Safety Education. *How Experienced Teachers Develop Good Traffic Citizens: Tips and Cues,* pp. 48-49.

North American Professional Driver Education Association. *The New Driver's Guide,* pp. 14-15, 75-76.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition,* pp. 99-104.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively,* pp. 40, 43-44, 51, 249-266.

Weimer, M. Wayne. *The Eye-Check Driver Evaluation and Instruction Method: Teacher's Manual.*

Urban Driving

The student should be able to identify the hazards and meet the particular requirements associated with urban driving.

With its volume of vehicle and pedestrian traffic, together with the density of traffic control devices, the urban environment demands the constant attention of drivers.

Visual demands appear to be about three times greater at 20 miles per hour in the city than at 60 miles per hour on a modern divided highway. In addition, driving in a city requires about twice as many actions as driving on a four-lane highway.

While they are less dramatic than accidents on the open highway, urban and suburban accidents account for two-thirds of accidents involving personal injury.

DRIVING TASK REQUIREMENTS

The student should know the procedures, as well as applicable laws, that pertain to driving in urban environments.

General

In urban areas, the driver should:

Minimize distractions from both inside and outside the car.

Radio volume should be modulated.

Sightseeing and conversing with passengers should be avoided.

Drive slowly and evenly, adjusting speed to the progressive light system.

Controlling speed in this manner eliminates frequent stopping for red signal lights.

Rapid acceleration after a green light, followed by an abrupt stop for a red light from intersection to intersection invites rear-end collisions and impedes traffic flow.

About a third of all urban accidents are rear-end collisions.

Select the lane that offers the best movement and visibility.

Watch for streets that are designated one way, taking care not to enter them illegally.

Sign and pavement markings indicate one-way streets, direction of movement, and restricted use of lanes.

Commercial Areas

In commercial areas, the driver should:

Watch for vendors and pedestrians, the latter especially during rush and noon hours.

Check for vehicles that may enter the roadway from driveways and alleys and for vehicles parked along the curb as well as those double parked while loading and unloading.

Residential Areas

In residential areas, the driver should:

Observe the posted speed limit.

Watch for pedestrians, especially children.

Areas where schools, playgrounds, and parks are located should receive special attention from the driver.

The student should know the skills that are necessary for driving in an urban environment.

The driver must have mastered the perceptual-motor skills involved in basic vehicle control (shifting, turning, stopping) to the degree that he performs them automatically, allowing him to attend to the demands of traffic controls, route signs, and other critical facets of the urban environment.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to drive in urban environments.

Stress of City Driving

A beginning driver is not accustomed to operating a car in an area where there is a great concentration of vehicular and pedestrian traffic and where a great number of traffic signs, signals, and lane markings require his attention. He must learn to constantly survey the driving environment which includes these factors, at the same time performing critical perceptual-motor skills.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	--	--
Chalkboard or traffic situation board for in-car use	--	--
Handouts/pamphlets	Ford Motor Company	"The Eyes Have It"
	National Safety Council	"City Driving" fact sheet
State Driver's Manual	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"City Driving Tactics," 17 minutes, color, Charles Cahill Associates, Inc.

"Defensive Driving Tactics,"* 12 minutes, color, Charles Cahill Associates, Inc.

"Space Driving Tactics," 15 minutes, color, Charles Cahill Associates Inc.

"City Driving," 22 minutes, b/w, Ford Motor Company.

"Driving in the City," 10 minutes, color, Ford Motor Company.

"Problems of City Driving," 11 minutes, b/w, Progressive Pictures.

"Perception of Driving Hazards, Part I," 30 frames, silent, color, Shell Oil Company.

"Driving in Cities and Towns," 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

Simulator Films

"Blending in Traffic," 20 minutes, color AEtna Life & Casualty Co.

"The Decision is Yours,"* AEtna Life & Casualty Co.

"Road Check," 20 minutes, color, AEtna Life & Casualty Co.

"Separating and Compromising Risks," color, AEtna Life & Casualty Co.

"Traffic Strategy," 16 minutes, color, AEtna Life & Casualty Co.

"Complex Traffic," 24 minutes, color, Allstate Enterprises.

"Drive in Review," 27 minutes, color, Allstate Enterprises.

"Intermediate Traffic," 22 minutes, color, Allstate Enterprises.

"Moderate Traffic," 26 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System*, film sections as follows: "Blending in Traffic," "Traffic Strategy," "Road Check," "IPDE," "Separating and Compromising Risks," and "Decision is Yours."

Allstate Insurance Company. *Allstate Good Driver Trainer System*, film booklets as follows: "Moderate Traffic," "Intermediate Traffic," "Complex Traffic," and "Drive in Review."

American Automobile Association. *Practice Driving Guide for Use with Sportsmanlike Driving*, pp. 25-26.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 175-188.

Anderson, William G. *In-Car Instruction: Methods and Content*, pp. 270, 277-279.

Anderson, William G. *Laboratory Manual for Learning to Drive*, p. 11.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies*, pp. 81-91, 181-183.

Anderson William G. *Teacher's Manual for Learning to Drive*, pp. 29-32, 49-52.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 188-197.

McKnight, A. James, and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 24-0 - 24-3.

McKnight, A. James and Hundt Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, pp. 50-51.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers*, pp. 62-66.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 223-224, 227-229, 258.

American Automobile Association. *Sportsmanlike Driving: Teacher's Guide*, pp. 39-40.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, pp. 213-219, 272.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 248-259.

Glenn, Harold T. *Youth at the Wheel*, pp. 179-192.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 166-179.

National Education Association. National Commission on Safety Education. *How Experienced Teachers Develop Good Traffic Citizens: Tips and Cues*, pp. 46-47.

North American Professional Driver Education Association. *The New Driver's Guide*, pp. 58-59.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 127, 116-118, 155.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 268-280.

Highway Driving

The student should be able to identify the hazards and meet the particular requirements of the open highway driving environment.

While hazards are not as prevalent on the open highway as they are in urban driving, the greater rate of speed increases the severity of accidents and therefore necessitates constant surveillance of other vehicles and roadway conditions.

DRIVING TASK REQUIREMENTS

The student should know the procedures and hazards that pertain to operating a car on open highways.

General

In driving on open highways the driver should, in general:

Position the car within the center of the lane in order to maintain distance from guardrails or median barriers and at the same time avoid interfering with other traffic.

Adjust speed to conditions, reducing speed on narrow or winding roadways or when signalized intersections are frequent.

> Traffic signals, by interrupting the flow of traffic on a main highway, create a potential hazard. Research has shown that increasing the number of signalized intersections can result in an increased accident rate.

Watch for traffic, pedestrians, or animals that may be hidden from view by trees, vegetation, or nearby roadside structures.

Avoid use of median for parking, except in emergencies, and cross the median only at designated crossover points.

> Extreme care is required in using crossover points. After crossing a median, the driver will be entering the fastest lane of travel and will have to accelerate from essentially a standing start. Research has shown that the greater the number of median openings on a multilane highway the higher the accident rate.

Rural Roads

On rural roads, the driver should anticipate and adjust to the following situations:

Narrow roadways and frequently poor surface conditions.

Limited sight distances imposed by frequent hills, dips, and curves.

Sharp curves and intersections that are not well marked.

Slow moving equipment, particularly farm vehicles.

Slow moving vehicles are, in most states, required to attach a day-glo orange triangular sign to the rear of the vehicle to warn traffic approaching from behind.

The speed differential caused by the mixture of slow and fast moving traffic is a significant contributor to accidents on rural roads.

Mountainous Terrain

When driving in mountainous terrain, the driver should:

Keep as far to the right edge of the roadway as is possible in order to increase lane separation from oncoming vehicles.

While it is generally desirable to maximize the separation from oncoming vehicles, it is particularly important in hilly or mountainous terrain where strong winds may tend to blow an oncoming vehicle toward an opposing lane.

Watch for signs indicating the following types of hazards:

Sudden changes in direction or elevation of the roadway.

Rock slides, washouts.

Refrain from sightseeing and give full attention to driving.

Long, Flat Stretches

When driving on long flat stretches for extensive periods, the driver should anticipate and attempt to prevent drowsiness.

While driving for long periods of time tends to produce fatigue in general, the monotonous characteristics of flat terrain often produce "highway hypnosis." This state, similar to fatigue, appears to result from a general lack of visual stimulation and a tendency to fixate the eyes in the middle of the roadway. The activities described in connection with reducing general fatigue, also apply to this form of fatigue (See section on Physical/Emotional Conditions.)

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to drive in open country.

Steering Difficulties Related to Speed Control

If a student driver, when driving in open country, is having difficulty maintaining direction or position within the driving lane, he may not be seated properly and may be holding the steering wheel incorrectly. More seriously, he may be driving too fast, a factor which can affect his ability to maintain longitudinal and lateral control of the car.

Surveillance Habits

Inability to track correctly, on open, rural, or mountainous roadways may be due to the driver's poor surveillance habits. As a matter of habit, the driver should learn to focus well ahead on the roadway and scan the roadside.

Maintaining Speed

The student driver may unnecessarily and abruptly accelerate and decelerate when driving in open country. This tendency to vary speed most likely occurs when he approaches curves. When the curves are gradual, accelerator reversals are unnecessary. Where the roadway is winding or contains sharp curves, however, intermittent pressure on the accelerator together with brake application is necessary.

Other Common Problems

Failure to adequately observe traffic, pedestrians, and animals in areas where roadside structures and vegetation are present.

Failure to increase separation distance in relation to oncoming vehicles on mountainous roadways.

Failure to note warning signs and changes in speed limits on open, rural, and mountainous roadways.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	–	–
Chalkboard or traffic situation board for in-car use	–	–
Charts and/or table on accident statistics related to highway driving	–	–
Handouts/pamphlets	National Safety Council	"Rural Driving" fact sheet; "Tips on Mountain Driving fact sheet
State Driver's Manual	–	–

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Blind Date," 12 minutes, color, Ford Motor Company.

"Driving Highways and Freeways," 10 minutes, color, Ford Motor Company.

"Perception of Driving Hazards," Part 3* filmstrip, silent, color, Shell Oil Company.

"Driving in the Country," Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

Simulator Films

"Safe Highway Driving,"* 16 minutes, color, AEtna Life & Casualty Co.

"Hit the Highways,"* 23 minutes, color, Allstate Enterprises.

"Perceptive Driving," 23 minutes, color, Allstate Enterprises.

*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide materials for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System* – Film sections as follows: "Highway Driving," and "Decision is Yours."

Allstate Insurance Company. *Allstate Good Driver Trainer System*, film booklet: *Hit the Highways.*

American Automobile Association. *Practice Driving Guide for Use with Sportsmanlike Driving*, pp. 22-23.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 228-231.

Anderson, William G. *In-Car Instruction: Methods and Content*, p. 271.

Anderson, William G. *Laboratory Manual for Learning to Drive*, p. 25.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies*, pp. 187-199.

Anderson, William G. *Teacher's Manual for Learning to Drive*, pp. 49-52.

McKnight, A. James, and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 25-0 - 25-1.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, pp. 52-53.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers*, pp. 66-69.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 234-235, 258-259.

American Automobile Association. *Sportsmanlike Driving: Teacher's Guide*, pp. 41-42.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, pp. 220-222, 273.

Center for Safety Education, New York University, *Man and the Motor Car*, pp. 260-273, 196, 306.

Glenn, Harold T. *Youth at the Wheel*, pp. 192-211.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 122-125; 180-205; 254-255.

National Education Association, National Commission of Safety Education. *How Experienced Teachers Develop Good Traffic Citizens: Tips and Cues*, p. 47.

North American Professional Driver Education Association. *The New Driver's Guide*, (Strasser/Aaron), pp. 60-61, 74.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 131-135, 165-166.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 282-286.

Freeway Driving

The student should be able to identify the hazards and meet the particular requirements associated with freeway driving.

Freeways, because of their multiple lanes, limited access, and relative lack of curves and hills, offer the safest and most comfortable route of automotive travel. However, because of the high speeds with which cars travel, traffic patterns can change extremely quickly. Drivers must therefore remain alert at all times to what other drivers are doing.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws that pertain to driving on a freeway.

Characteristics of a Freeway

Freeways are multilane roadways which permit drivers to travel at high speeds for long distances. There are no intersections, cross traffic, or traffic signals, and pedestrians are prohibited from using these roadways. Statistics have shown that even though the average speed on modern expressways is well above the average speed on other roadways, the fatality rate is only one-fifth to one-third that on other roadways.

Most expressway accidents occur, not during adverse weather conditions, but when the roadway is dry. Major factors for this are the high rate of speed and sudden changes in traffic conditions.

Entering the Main Roadway

When first entering the main roadway, the driver should

Stay in the right lane until the car reaches the speed of through traffic.

Maintain speed commensurate with the flow of traffic.

Check rearview mirror frequently for vehicles closing fast.

This may be an indication that the car's speed is too slow for the traffic flow.

Moving With the Traffic

When moving with the traffic on the freeway, the driver should

Select the appropriate lane in relation to the car's speed, anticipated maneuvers, and the traffic flow.

For each freeway and traffic condition there is a maximally "safe lane."

Select speed on the basis of the posted limit, weather and light conditions, and traffic flow and volume.

Nearly half of freeway accidents are related to cars moving too fast for conditions.

Under normal conditions, the driver should maintain a speed no less than 15 miles under the posted limit.

Scan the roadway well ahead for traffic situations and road contour, and watch traffic surrounding the car.

Vehicles following slower-moving vehicles may suddenly enter the car's lane.

Outbound traffic from urban areas should receive special caution.

Cutting in attributes to about one-fourth of urban expressway accidents.

Checking the rearview mirror at least one or two times a minute will determine the location of following vehicles.

At least half of freeway accidents are rear-end collisions.

Crests and sags in an expressway decrease visibility even on a freeway and require alertness. A large percentage of freeway accidents occur at crests and sags.

Check the display panel frequently.

Sustained high speed causes a considerable amount of mechanical trouble, some of which can be detected by monitoring the various gauges.

Approaching and Passing Interchanges

When approaching and passing interchanges, the driver should:

Anticipate that vehicles ahead will slow down.

Anticipate that a vehicle in the deceleration lane may swing back into the right lane at the last minute.

Drivers often occupy the deceleration lane inadvertently because they are not paying attention.

Move to the passing lane when there are two lanes of traffic, to the middle lane with three or more lanes.

Moving to the passing or middle lane when approaching interchanges enhances the flow of traffic by facilitating the entry of vehicles from the on ramp to the main roadway.

Return to "safe lane" (generally the right lane or through lane) after passing the interchange.

The student should know the skills required for driving safely on freeways.

High Speed Steering

At high speeds, the results of moving the steering wheel are greatly magnified. The driver must be able to maintain direction with the curvature of the roadway when operating the car at high speeds, without oversteering.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to drive on freeways.

High and Low Speed Steering

Some beginning drivers may experience steering difficulties when driving at high speeds because steering wheel motions are greatly magnified at high speeds. Before the student driver can drive safely on freeways he must have mastered high speed steering in addition to low speed steering.

Maintaining Speed

The student driver may unnecessarily and intermittently release pressure on the accelerator pedal. This tendency is most likely to be exhibited when approaching gradual curves on unlimited access roadways.

Other Common Problems

Maintaining a speed that is reasonable and within the posted limits, in relation to weather and light conditions, traffic flow, and the volume of traffic.

Determining the rate of closure of other vehicles.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	--	--
Chalkboard or traffic situation board for in-car use	--	--
Charts and/or tables on accident statistics	--	--
Handouts/pamphlets	American Automobile Assoc.	"Getting the Most Out of Freeway Driving"
	National Safety Council	"Driving, Freeway"–data sheet "Driving on Superhighways"–fact sheet "Test Your Turnpike Tactics" "Turnpike Traps"–safety brief
	Ontario Dept. of Transport	"Freeway Driving is Different"
State Driver's Manual	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Driving the Freeways," No. 1, Driver Education Films Series, 4-½ minutes, b/w, American Oil Co.

"Driving Expressways," No. 8, Techniques of Defensive Driving Film Series, American Oil Company.

"Freeway Driving Tactics," 16 minutes, color, Charles Cahill Associates, Inc.

"Driving at Freeway Speeds," filmstrip, 22 frames, color, Ford Motor Company.

"Driving the Super Highways," 10 minutes, b/w, Ford Motor Company.

"Passing on the Freeway," filmstrip, 17 frames, color, Ford Motor Company.

"Freeway Driving," 11 minutes, color, International Film Bureau, Inc.

"Freeways are Different," 14-½ minutes, color, Michigan Dept. of State Highways.

"Freeway Driving is Different," 14 minutes, color, Motion Picture Services.

"Multiple Lane Traffic," 16 minutes, b/w, Progressive Pictures.

"Perception of Driving Hazards, Part 2," filmstrip, silent, color, Shell Oil Company.

"Driving on Freeways," 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

"Freeway Phobia, Part I," 15 minutes, color, Walt Disney, Inc.

"Freeway Phobia, Part II," 15 minutes, color, Walt Disney, Inc.

Simulator Films

"Expressway Excellence," 17 minutes, color, AEtna Life & Casualty Co.

"Expressways are Different," 24 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System*, film section "Expressway Excellence."

Allstate Insurance Company. *Allstate Good Driver Trainer System*, film booklet "Expressways are Different."

American Automobile Association. *Practice Driving Guide for Use with Sportsmanlike Driving*, pp. 27-28.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 189-207.

Anderson, William G. *In-Car Instruction: Methods and Content*, p. 271.

Anderson, William G. *Laboratory Manual for Learning to Drive*, p. 25.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies*, pp. 187-199.

Anderson, William G. *Teacher's Manual for Learning to Drive*, pp. 49-52.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 213-224, 275.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 26-0 - 26-3.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, pp. 54-56.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers*, pp. 69-72.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization,* pp. 238-240.

American Automobile Association. *Sportsmanlike Driving: Teacher's Guide,* pp. 43-44.

Center for Safety Education, New York University. *Man and the Motor Car,* pp. 274-281.

Glenn, Harold T. *Youth at the Wheel,* pp. 166, 210-219, 238.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 125, 212-237, 367.

"How to Drive on a Superhighway," *Changing Times,* pp. 13-15, June, 1956, The Kiplinger Washington Editors, Inc., Editors Park, Maryland.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), pp. 62-63.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition,* pp. 139-144.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively,* pp. 287-297.

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III-B-2

Normal Driving Situations

Following
Passing
Leaving Traffic
Entering Traffic
Lane Changing
Parking
Emergency Areas
Driving by Parked/Parking Vehicles
Overtaking
Special Vehicles
Negotiating Intersections
Traffic Circles
On-Ramps
Off-Ramps
Hills
Curves
Lane Usage
Off-Street Areas
Railroad Crossings
Bridges and Tunnels
Toll Plazas

Following

The student should, when following another vehicle, maintain a distance that will enable him to avoid a collision in the event the vehicle ahead stops suddenly.

While following too closely is rarely the cause of an accident, it is second only to speed as a contributor to accident frequency and severity. The best practice is simply to avoid following; that is, either pass the vehicle ahead or drop back. However, when traffic conditions necessitate following a vehicle, the driver must follow at a distance that will enable him to avoid a rear-end collision if the vehicle ahead should stop suddenly. What constitutes a safe distance will vary with the nature of the vehicle ahead, the roadway, and the weather.

DRIVING TASK REQUIREMENTS

The student should know the procedures for maintaining a safe distance behind another vehicle.

A driver should allow enough distance between his car and the vehicle ahead to avoid having to swerve or stop suddenly because of unexpected moves by other drivers or because of fluctuations in traffic. The number of rear-end collisions each year—one-fourth of all fatal and nonfatal accidents—indicates that many drivers do not give themselves enough space to stop.

Normal Separation Distance

Under normal driving conditions, the driver should

Maintain enough separation to be able to stop the car with adequate space between it and the lead vehicle.

On dry pavement under average traffic conditions a two-second following distance should constitute the minimum.

Increasing Separation

The driver should increase following distance under the following circumstances

In response to the behavior of the driver ahead.

Failure of the driver to note that the lead vehicle is signaling or in the process of changing lanes is a factor in rear-end collisions.

When increasing speed.

When driving behind dual-wheeled vehicles.

When a driver follows too closely behind a large vehicle, his forward vision is blocked

When driving behind two-wheeled vehicles.

Because of their light weight, two-wheeled vehicles require shorter stopping distances than do cars.

When traffic intersects, merges, or diverges.

When following emergency vehicles.

The separation distance between the driver and an emergency vehicle should be at least 500 feet.

The driver should increase following distances under the following circumstances.

When he is fatigued.

During darkness and other periods of limited visibility.

When road conditions are hazardous.

When the vehicles ahead are proceeding slowly, stopping frequently, or are obscuring visibility.

Adjusting Speed

The driver should reduce speed when observing the following conditions, which indicate that the lead vehicle is reducing speed.

More rapid closure of the car on the lead vehicle.

Hand signals from the driver of the lead vehicle.

Activation of the lead vehicle's brake light or turn signals.

In adjusting the speed of the car, the driver should:

Remove his foot from the accelerator.

Tap the brake pedal lightly to warn following traffic and to reduce his speed further.

If the vehicle ahead stops, the driver should:

Apply the brakes quickly enough to stop while leaving sufficient space between the car and the vehicle ahead to permit him to drive around the vehicle without backing up.

Observing the Roadway Ahead

The student should observe the configuration of the roadway ahead and expect the lead vehicle to reduce speed when approaching the following:

Uncontrolled intersections.

Highway entrances and exits.

Junctions in the roadway where traffic diverges.

The student should know the skills required for maintaining a safe following distance.

The driver must be able to perceive changes in the separation distance or apparent vehicle size, depending upon the distance involved, and adjust the car speed to changes in the lead vehicle's speed.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to maintain a safe following distance.

Perception of Changes in Separation Distance

Beginning drivers may have difficulty in perceiving changes in the distance between his car and the vehicle ahead, and he will follow too closely.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--
Handouts/pamphlets	National Safety Council	"A Following Distance You Can Count On" safety brief "Stop Accidents Right Smack in Front of You"
Tables and/or charts on rear-end collisions	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Reaction Brakes Time and Space," 9 minutes, color, Charles Cahill Associates Inc.

"Speed Driving Tactics," 15 minutes, color, Charles Cahill Associates Inc.

"The Car Ahead," Techniques of Defensive Driving Film Series, 10 minutes, color, National Safety Council.

"Following Distance You Can Count On," 2 x 2 slides, color, w/script, National Safety Council.

"How to Follow Safely," Defensive Driving Film Series, b/w, 10 minutes, National Safety Council.

"Can Your STOP in Time?"* 8 minutes, color, American Mutual Insurance Alliance.

"Following Too Close," University of Michigan.

"Perception of Driving Hazards, Part 2," filmstrip, silent, color, Shell Oil Co.

"Tailgating," Defensive Driving Series, 10 minutes, b/w, United World Films.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Simulator Films

"Blending in Traffic,"* 20 minutes, color, AEtna Life & Casualty Co.

"Expressway Excellence,"* 17 minutes, color, AEtna Life & Casualty Co.

"Road Check,"* 20 minutes, color, AEtna Life & Casualty Co.

"Safe Highway Driving,"* 16 minutes, color, AEtna Life & Casualty Co.

"Drive in Review,"* 27 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System*, film sections as follows: "Blending in Traffic," "Highway Driving," "Expressway Excellence," "Road Check," "Decision is Yours," and "Crash Avoidance."

Allstate Insurance Company *Allstate Good Driver Trainer System*, film booklets as follows: "Hazardous Situations" and "Drive in Review."

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 101-104.

Anderson, William G. *In-Car Instruction: Methods and Content*, pp. 87-88.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 202, 220-221.

McKnight, A. James, and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 31.0 - 31.5.

McKnight, A. James, and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, pp. 58-60.

SUPPLEMENTARY REFERENCES

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, pp. 50-51.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 261-262, 278.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 112-117, 183, 218, 224-225, 234, 247, 257.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 106-108, 141.

North American Professional Driver Education Association. *The New Driver's Guide*, pp. 54-55, 75.

"Shop Talk: Teaching Safe Following Distances," *Driver Training*, Spring 1971.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, p. 287.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Passing

The student should be able to perform a safe pass on two- or three-lane roadways.

The term "passing" in this Guide will refer to passing another car on a two- or three-lane road where the need to make temporary use of a lane also used by oncoming traffic imposes a limit upon the distance and time that may be consumed by the passing maneuver. Passing on multilane highways, where the threat of oncoming traffic is not great, is considered essentially a lane changing maneuver and is treated as such.

The ability to pass safely is limited by the distance available within which to complete the pass. This distance may be limited by (1) oncoming cars, (2) roadway configurations that may conceal oncoming cars, and (3) legal prohibitions against passing. The ability to judge whether a pass can be completed within the available distance is one of the most complex yet critical skills demanded of drivers. The maneuver accounts for approximately one-fifth of the fatal accidents each year.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws that pertain to passing on two-lane and three-lane roadways.

Passing another vehicle is a complex procedure, requiring the driver to make decisions based on his own good judgment. He has no allowance for doubt and indecision. Doubt increases decision time and decreases the time available to complete the pass. With any doubts, he should not undertake the procedure.

Deciding to Pass

In determining whether it is safe to initiate a pass on a two-lane or three-lane roadway, the driver should:

Observe the roadside for signs indicating he is within or approaching a no-passing zone.

When a sign indicates the end of the no-passing zone, the passing procedure may be initiated.

Observe lane markings to the left side of the lane.

Passing should not be initiated when the left side of the lane is marked with one or two solid lines or if there is a solid line to the right of a broken line.

Passing is permitted when there are no lane markings or if the left side of the lane is marked by a broken line or by a broken line to the right of the solid line.

The end of a no-passing zone should not be anticipated by initiating a pass prematurely. On a two-lane roadway, nearly half of all drivers will initiate the pass before prohibitive lane markings end.

Observe the roadway ahead.

Passing limitations on the roadway itself are sometimes disregarded by drivers, thus causing a significant number of accidents each year. These limitations include:

Hills and curves which restrict sight distance.

Intersections, where it is illegal to pass and where unexpected vehicle maneuvers may occur, such as the lead vehicle suddenly attempting a left turn; traffic entering from the right and forcing the lead vehicle to the left; failure of other vehicles to check for oncoming traffic before entering the lane.

Bridges, tunnels, and railroad crossings.

Pedestrians on the right of left edge or shoulder of a two-lane roadway.

The available passing distance may be judged by observing the roadway ahead. Drivers consistently underestimate the required overtaking and passing distance. At 50 miles per hour, more than 75 percent of the estimates for overtaking and passing distances are considered dangerous.

The speed of the lead vehicle may be judged when observing the roadway ahead.

When the lead vehicle's speed is 50 miles per hour, approximately 750 feet are required to complete the pass.

In an accelerative pass, the driver is able to judge the speed of the lead vehicle from the speed of his own car.

In a flying pass (where the original speed of the passing car is greater than the speed of the vehicle being passed), the driver judges the closing rate between the car and the lead vehicle.

Available passing time may be judged, based on the driver's judgment of passing distance and closing rate.

A driver's ability to judge closing rate is quite limited, but he responds appropriately to passing distance and the speed of the lead vehicle.

Accelerative capability of the car may be judged, with consideration given to the car's load (e.g., pulling a trailer), power of the engine, and condition of the car.

Most cars, with normal acceleration capability, require approximately six seconds to pass a moving vehicle at normal highway speeds. Acceleration capability decreases as speed increases, the degree varying among car types.

The safety margin available for returning to the driving lane may be determined by observing the roadway ahead.

Finally, by observing the roadway ahead, a determination can be made as to whether the pass can be completed safely within the available passing distance. If there is any doubt, the pass must not be initiated.

In determining whether it is safe to initiate a pass, the driver should also:

Observe oncoming traffic.

Failure to note an oncoming vehicle or misjudging the speed and distance of the oncoming vehicle is a primary cause in a significant number of accidents.

In observing oncoming traffic in order to make a decision to pass, the driver's judgment continues to be the major factor. He must make estimates on the distance and speed of the first oncoming vehicle and continue to judge the available passing time and the accelerative capacity of the car.

Drivers tend to overestimate short distances and underestimate long distances between the car and the oncoming vehicle.

Curves and hills greatly reduce the driver's ability to judge the distance at which an oncoming vehicle would be visible.

A driver's judgment of the speed of the oncoming vehicle is poor, because he is influenced by his own speed. Inability to estimate speed results in a tendency to assume there is a constant passing time. This, in turn, causes the driver to underestimate the time required for passing at high speeds and to overestimate the time at low speeds.

Observing oncoming traffic aids the driver in determining whether he can complete the pass in the available passing distance, and without excessive speed.

Average passing times range from six seconds to ten seconds. The shortest average safety margin is five seconds.

Five percent of drivers accept hazardous passing opportunities; at least 25 percent reject safe passing opportunities.

In further determining whether it is safe to initiate a pass, the driver should:

Observe the lead vehicle.

Passing should be attempted when the lead vehicle exhibits any of the following:

Indications, of a left turn, by signal or other means.

Change in lane in preparation to pass.

Weaving or wandering, indicating the driver may be drowsy, inattentive, intoxicated, or ill.

Sudden deceleration, indicating, for example, he may be passing pedestrians, cyclists, or animals.

The gap ahead of the lead vehicle may be checked, and if it is too small, the pass should not be initiated.

If the lead vehicle is being passed by another vehicle, passing should not be initiated until the vehicle initiating the first pass has completed the maneuver, the roadway ahead is clear, and an acceptable gap is available.

Passing behind another vehicle on a two-lane or three-lane roadway is dangerous because the passing vehicle may delay its return to the driving lane or may not leave an adequate gap for the car to reenter the driving lane in time for the driver to avoid oncoming traffic.

Preparing to Pass on a Two-Lane or Three-Lane Roadway

In preparing to pass, the driver should:

Select the proper passing lane.

Only the left lane is used for passing moving traffic.

The right lane may be used for passing when the vehicle is stopped in the center lane for a left turn.

Observe other traffic.

Signal his intention to change lanes.

Signaling well in advance of changing lanes reduces the possibility that the vehicle following will pull out and attempt to pass the car.

Maintain proper following distance before changing lanes.

Following distance should be sufficient to permit the driver to check the clearance ahead, to accelerate before passing, and, if necessary, to decelerate and reenter the driving lane.

Initiating a Pass on a Two-Lane or Three-Lane Roadway

When initiating the passing maneuver on a two-lane or three-lane roadway, the driver should:

Signal the lead vehicle by flicking the lights at night or by sounding the horn when necessary.

When the vision of the driver of lead vehicle is obscured by a trailer, an open trunk lid, snow on the rear window, and so on, the driver of the passing car should sound his horn.

Passing a Vehicle on a Two-Lane or Three-Lane Roadway

When passing the vehicle ahead on a two-lane or three-lane roadway, the driver should:

Move quickly through the blind spot of the lead vehicle. The car should be moving 5-10 mph faster than the vehicle being passed.

This blind spot is located at the 7-8 o'clock position of the lead vehicle where the vision of the lead vehicle's driver is obscured by the post of the left rear window.

Continue the passing maneuver with minimum delay.

Stay within the speed limit unless exceeding the limit becomes necessary.

If sudden acceleration is needed, a forced downshift can be made which gives extra power and speed. A forced downshift for automobiles equipped with automatic transmissions is made by rapidly pressing the accelerator to the floor. Obtaining a similar amount of power and speed for manual shift automobiles requires a shifting into second gear and then rapidly pressing the accelerator to the floor.

Abort the pass and return to the driving lane if there is doubt the pass can be completed safely.

As stated earlier, doubt increases decision time and diminishes the time available to pass.

Returning to Driving Lane

When returning to the driving lane after passing on a two-lane or three-lane roadway, the driver should:

Wait until he can see both headlights of the vehicle just passed.

Signal with the right hand directional turn signal his intentions to return to the right lane.

Steer the car smoothly back into the driving lane, positioning it in the center of the lane.

> A significant number of accidents each year are caused when the driver swerves sharply in front of the passed vehicle. The passing driver oversteers, or the driver of the passed vehicle panic brakes.

Cancel the turning signal.

Adjust his speed to the flow of traffic in the driving lane.

The student should know the skills required for passing.

Before deciding to pass the lead vehicle, the driver must be able to judge the available passing time and distance.

When there is no oncoming traffic, the driver should base his judgment of time on the distance available—that is, the distance between his car and the end of a passing zone or some other limiting circumstance, such as a curve or hill. When there is an oncoming vehicle, he should base his judgment of available passing time on available distance and his judgment of the speed of the oncoming vehicle. Drivers can judge distance more accurately than they can judge the speed of an oncoming vehicle. They tend to underestimate the speed if the vehicle is traveling fast and overestimate if it is traveling slowly.

The driver must also be able to judge the amount of time or distance required to pass the lead vehicle. He should know the accelerative capacity of his car, given the speed he is traveling, the load he is carrying, and the operating condition of the car.

In addition, he must be able to judge the rate differential (closing gap) between himself and the lead vehicle.

The driver should avoid making a series of individual judgments; rather, he should combine the cues of speed and distance into an overall perception of a safe or unsafe pass.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to pass other vehicles.

Prolonged Precautionary Check to Side and Rear

The passing maneuver can be very dangerous for any driver, but especially for the beginner. While the driver is using the mirrors to check conditions to the rear and side, his car is moving forward. Obstacles move into the path in front while he is checking to the rear, and he may not have time to react. In addition, the car veers from its established path while the student is making the precautionary checks, or the student may fail to perceive obstacles in front. The instructor should emphasize the necessity for making brief rather than prolonged checks and for maintaining a constant awareness of the roadway ahead.

Reluctance to Pass a Moving Vehicle

The beginning driver may exhibit a reluctance to pass another vehicle, even though it is safe to do so and even though he may be driving under the speed limit behind a slow-moving vehicle. He must be encouraged to perform the maneuver when it will expedite traffic and when it is safe. Telling the new driver the number of feet and/or the number of seconds required to pass safely will not be too meaningful to him, although he should know that the range is from six to ten seconds at normal highway speeds, in a car with normal acceleration capability. The instructor should time a safe passing procedure for the beginning driver to give him a "feel" for this element of the maneuver. He should soon begin to realize that (1) adequate time for passing is indeed 6-10 seconds, (2) anything less is dangerous; and (3) taking 15 seconds to complete the procedure causes a bottleneck which may result in hazardous conditions. Simulated passing drills will also help the new driver acquire confidence in himself before he practices on the street.

Judging the Available Passing Time or Distance

A beginning driver will have a problem in determining the available passing time or distance. When there is no oncoming traffic, he must learn to make a judgment based upon the distance available between the car and the limiting circumstance, such as the end of the passing zone, a curve, or a hill. When there is an oncoming vehicle, he must learn to make a judgment based upon available distance and his estimate of the speed of the oncoming vehicle. Drivers tend to judge distance more accurately than they do the speed of an oncoming vehicle.

As the beginning driver progresses through the instruction he should develop the ability to make better estimates of passing time, distance, and rate of closure. With development of his perceptual skills many of the difficulties he experiences in passing other vehicles should become less troublesome.

Gap Ahead of Vehicle Being Passed

Another perceptual activity the beginning driver must undertake when deciding to pass is the assessment of the suitability of the gap in front of the vehicle being passed. This assessment is particularly critical on two-lane roadways. A beginning driver may concentrate on his speed, or oncoming traffic, and neglect to determine if there is space ahead of the vehicle ahead to permit reentry into the driving lane. Beginning drivers should be warned of the danger of not determining the suitability of the gap in front of the lead vehicle.

Freezing at the Wheel

The passing maneuver is demanding on the beginning driver. In addition to making a series of critical judgments, he must control speed, maintain directional control, and maintain a constant surveillance for potential hazards. The maneuver is an exciting one that frequently absorbs the student driver to the extent that he gives inadequate attention to the usual surveillance checks for potential hazards. It is not uncommon for a beginning driver to "freeze" at the wheel when an unforseen obstacle suddenly appears in the passing lane at a point midway through the maneuver.

Instructors should be aware of the possibility of such occurrences. Use of a driving range practically eliminates the possibility of the sudden appearance of an obstacle or animal during the course of the maneuver. However, a decision to restrict instruction of the passing maneuver to the range should be weighed against the fact that a new driver will profit from supervised on-street instruction.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	--	--
Chalkboard or traffic situation board for in-car use	--	--
Charts and/or tables on accident statistics related to passing	--	--
Handout/pamphlet	National Safety Council	"Six Points for Completed Pass"

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Passing Maneuvers No. 1–The Basic Passing Maneuver," filmstrip, 60 frames, color, Ford Motor Company.

"Passing Maneuvers No. 2–Hazard on the Side," filmstrip, 57 frames, color, Ford Motor Company.

"Passing Maneuvers No. 3–Oncoming Traffic," 57 frames, color, Ford Motor Company.

"Passing Maneuvers No. 4–Being Passed," 51 frames, color, Ford Motor Company.

"Passing Maneuvers No. 5–Passing Emergencies," 64 frames, color, Ford Motor Company.

"How to Pass Safely," No. 6, Defensive Driving Film Series, 10 minutes, b/w, Association Films, Inc.

"Passing/Being Passed,"* No. 6, Techniques of Defensive Driving Series, National Safety Council.

"The Perfect Pass," 30 2x2 slides, National Safety Council.

"Passing Fancy," 15 minutes, b/w, General Motors Corporation.

Simulator Films

"Perfect Passing," 17 minutes, color, AEtna Life & Casualty Co.

"Road Check,"* 20 minutes, color, AEtna Life & Casualty Co.

"Hit the Highways,"* 23 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System,* film sections as follows: "Perfect Passing," "Road Check," "Separating and Compromising Risks," and "Crash Avoidance."

Allstate Insurance Company, *Allstate Good Driver Trainer System,* film booklet, "Hit the Highways."

American Automobile Association. *Teacher's Handbook–Sportsmanlike Driving,* 6th Edition, pp. 150-154, 183-184.

Anderson, William G. *In-Car Instruction: Methods and Content,* pp. 193-201.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

BASIC REFERENCES (Continued)

Anderson, William G. *Learning to Drive: Skills, Concepts and Strategies*, pp. 131-138.

Anderson, William G. *Teacher's Manual for Learning to Drive*, pp. 38-41.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 120, 161-162, 191-192, 199-202, 220-222.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis, Volume I: Task Descriptions*, pp. 32-0 - 32-7.

McKnight, A James, and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, pp. 62-66.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers*, pp. 31-36.

Quane, W. Laurance, *Utilizing the Multiple Car Driving Range*, pp. 18, 20-21, 36-37, 39, 67-68.

SUPPLEMENTARY REFERENCES

Aaron, J.E. and Strasser, M.K. *Driver and Traffic Safety Education*, p. 259.

American Automobile Association. *Sportsmanlike Driving, Practice Driving Guides, for use with Sportsmanlike Driving*, 6th Edition, p. 23.

American Automobile Association. *Te[illegible] Driver and Traffic Safety Education*, pp. 401-402.

Anderson, William G. *Laboratory Manual for Learning to Drive*, p. 17.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, pp. 53-54.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 204, 205, 262-268.

Glenn, H.T. *Youth at the Wheel*, pp. 166-167, 192-196, 247-251.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 121-122, 176, 194-205, 224, 234, 367.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 135.

Strasser, M.K. and Aaron, J.E. *The New Driver's Guide*, pp. 56-57, 63.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 165, 270, 283-285, 287-288, 291.

Leaving Traffic

In leaving the roadway, the student should be able to select an appropriate site and to avoid excessive interference with the flow of traffic.

A driver who intends to leave the roadway must assure himself that the site he has selected will accommodate him and that he enters that site at a safe speed. At the same time, he must be cognizant of the fact that vehicles behind him will not generally anticipate his action, making it particularly important that he signal his intentions well in advance and avoid reducing his speed any more than is necessary.

DRIVING TASK REQUIREMENTS

The student should know the procedures for leaving traffic safely with minimal interference to the vehicles behind and to the side of the car.

Selecting a Suitable Place to Leave the Roadway

The area immediately alongside a high-speed or heavily traveled roadway is not generally an appropriate place to stop. Not only does the act of stopping tend to disrupt the flow of traffic, thereby creating hazards, but the car is always in some danger while it is close to the roadway. However, unanticipated problems such as mechanical breakdowns occasionally require the driver to leave the roadway. In doing so, he must select an area and leave the roadway in a manner that will not create a hazard to himself or others. He should

Observe the shoulders and median to determine whether they are firm and wide enough to accommodate the car.

A car should not be driven onto soft shoulders and medians because they could cause the car to skid or turn over. Road signs usually warn drivers of soft shoulders.

Narrow shoulders may prevent the driver from parking completely off the roadway. A car that is partially on the roadway obstructs traffic and may be hit by another vehicle.

Observe the shoulder for obstructions such as trees, utility poles, and sign posts which could prevent the car from fully entering the shoulder.

Check for vehicles parked along the side of the road.

When other vehicles are already parked along the side of the roadway, the driver should select a space large enough between vehicles to permit him to enter safely and clear the roadway completely.

Ascertain that the car will be visible to other drivers when it is off the roadway.

Traffic in either direction should be able to see the car from a distance of at least 200 feet.

Leaving the Roadway

After locating a suitable place to leave the roadway, the driver should:

Signal to following traffic his intention to leave the roadway.

Communicating to other drivers well in advance of leaving the roadway will reduce the risk of being hit from behind.

Slow down to a safe exit speed.

After a period of sustained high speed, a driver tends to feel he has reduced his speed more than he actually has. He must check the speedometer to make sure he has decelerated adequately for a safe exit. If the speed is too high, the driver could lose control of the car or collide with a vehicle parked at the side of the road.

On unpaved shoulders, exit speed should be about 10 miles per hour. Leave the roadway completely before stopping.

On paved shoulders where a higher exit speed is possible, the driver should avoid excessive deceleration on the roadway in order to minimize the disruption of traffic and the chances of being struck from the rear.

The student should know the skills involved in leaving a line of traffic.

The driver should develop the ability to select a shoulder that is firm enough and wide enough for the car. He should also be able to judge whether the place he selects to stop along the side of the road can be seen at a safe distance by vehicles approaching from both directions.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to leave the roadway safely.

Reluctance to Leave the Roadway

An inexperienced driver may be reluctant to leave the roadway, particularly if the shoulder area appears to be narrow or covered with loose gravel or soft dirt or sand. To help alleviate some of the fears the beginning driver might have, the instructor should demonstrate the maneuver.

Physical Appearance of Shoulders

Selecting a suitable place to leave the roadway requires the driver's ability to assess the physical appearance and safety of roadway shoulders. Often road signs warn the driver of soft shoulders that may cause the car to skid or turn over. When there are no signs the driver must make a judgment himself as to the condition and safety of the shoulder.

The new driver may also have difficulty determining whether the shoulder is wide enough. Width may vary from one area to another along the same roadway, and the driver must make a judgment on the width while the car is moving.

Selecting a Safe Speed to Leave the Roadway

The inexperienced driver may have difficulty in determining a safe speed to leave the roadway. Traffic on the roadway, as well as roadside conditions, must be considered. The new driver may be reluctant to leave the roadway at 10 miles per hour, the recommended speed for driving onto an unpaved shoulder. On the other hand, he may attempt to leave the roadway at speeds that are hazardous. Permitting the student driver to practice leaving the roadway will help him develop an ability to estimate a safe speed.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	--	--
Chalkboard or traffic situation board for in-car use	--	--

FILMS/SILMSTRIPS/SLIDES

Simulator Films

"Safe Highway Driving,"* 16 minutes, color, AEtna Life & Casualty Co.

"You Take the Wheel,"* 22 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System*, film sections as follows: "Highway Driving" and "Decision is Yours."

Allstate Insurance Company. *Allstate Good Driver Trainer System*, film booklet, "You Take the Wheel."

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 264-265.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 33-0 - 33-3.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, pp. 70-71.

Quane, W. Laurance, *Utilizing the Multiple Car Driving Range*, pp. 15, 18-19, 36-37, 72.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Entering Traffic

The student should be able to enter a stream of traffic with minimum interruption of traffic flow.

Any time a driver enters the roadway from a curb or driveway, he risks interrupting the flow of traffic, thereby constituting a potential hazard to cars already on the roadway. The driver may reduce this hazard by entering the roadway at a point and time that will minimize the interruption, by warning vehicles on the roadway of his intent, and by entering the stream of traffic as quickly and smoothly as possible.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws associated with entering the roadway from the roadside and from a parking space.

A driver gets into his car several times a day and enters traffic. The degree of difficulty and the hazards involved in this maneuver depend on the characteristics of the roadside or the parking space he is leaving, the proximity of other parked vehicles, and the movement of other vehicles in the roadway.

Accidents are frequent when drivers attempt to enter traffic. The more serious ones may involve pedestrians, sometimes children, who may be behind the car and are not seen by the driver. However, most are minor—scratches and dents in fenders that occur because the driver fails to check traffic and other parked vehicles before he pulls out of the parking space.

No accurate statistics are available on this type of accident, because many of them are too minor to be reported to the police. Drivers usually prefer to pay the cost of repairs themselves rather than submitting a claim to their insurance company and risking an increase in premium or cancellation of the policy.

Entering Traffic from the Roadside

To enter traffic safely from a stopped position on the roadside with minimal interruption of traffic flow, the driver should:

Observe traffic to the front and rear.

Watch for an adequate gap in rear approaching traffic.

> Traffic approaching from the rear is entitled to proceed. A car pulling out must yield the right-of-way.

Signal his intentions to enter the roadway.

Accelerate smoothly into the gap, turning the steering wheel, if entering the pavement from the shoulder, so that the wheels cross the pavement edge at a sharp angle.

Straighten the wheel to avoid encroaching upon the far lane, and accelerate quickly to match the speed of the traffic.

Cancel his directional signal.

Leaving a Parallel Parking Space

When leaving a parallel parking space blocked by a parked vehicle ahead, the driver should:

Back up slowly and stop before touching the vehicle behind.

Turn the steering wheel sharply toward the roadway and shift to drive or low gear.

Signal a turn and check traffic to the front and rear following the procedures for entering traffic.

> Activating the turn signal is not enough. The driver must also make a visual check to confirm that his signal has been detected by other drivers. An arm signal may be more visible to other drivers than the electrical turn signal especially with a vehicle directly behind.

Accelerate forward slowly, making sure the car will clear the bumper of the vehicle ahead.

> If more clearance is needed, the driver can repeat the above procedure—in addition, turning the steering wheel toward the curb while backing.

Leaving Angular and Perpendicular Parking Spaces

If facing traffic when leaving a perpendicular parking space, the driver should:

Check traffic from the right and left.

Move forward slowly a few feet, without impeding traffic, to provide turning clearance from adjacent parked vehicles.

Turn the steering wheel as sharply as necessary to achieve the desired direction.

Check the vehicles on both sides and traffic to the rear and back up slowly, holding the wheel straight and watching for traffic that may have been obscured from view by parked vehicles on either side.

When backing out of an angular or perpendicular parking space, the driver should:

Check the vehicles on both sides and traffic to the rear and back up slowly, watching for traffic that may have been obscured from view by parked vehicles on either side.

> Stationing a passenger outside the car can assist the driver in leaving a parking space when close proximity of other vehicles makes it difficult for the driver to see oncoming cars or to judge clearances.

Turn the steering wheel to the right when assured the car will clear adjacent vehicles.

Straighten the steering wheel and stop when the car has fully entered the traffic lane and shift to drive or low gear, proceeding forward slowly in the lane.

The student should know the skills required for safely entering the roadway from the roadside and from a parking space.

The driver must be able to assess the suitability of the gap in the traffic which will permit him to enter the flow of traffic. He must decide if the gap is large enough or if the size will change due, perhaps, to fluctuations in the speed of the vehicles involved. He must be able to judge the speed of the rear-approaching traffic in order to time his entry into the gap.

The driver must be able to leave a tight parallel space by integrating sharp steering maneuvers with careful forward and backward movements. He must then be able to judge when the car will clear the vehicle parked in front. These maneuvers must be carried out as quickly as possible so that traffic is not impeded.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to enter traffic from the roadside and from a parking space.

Assessing the Suitability of the Gap in Traffic

Whether entering traffic from a position on the shoulder or from a parking place the driver will be required to select a safe time for doing so. A beginning driver may be hesitant about moving onto the roadway, because he is unable to estimate the speed of rear approaching traffic. Judging speed is a perceptual skill that will require time to develop.

The instructor should be certain that the student driver turns his body to a position that enables him to see rear approaching traffic without depending completely on mirrors. It is hazardous to rely solely on the side and/or rearview mirrors when estimating a suitable gap for entering traffic.

The instructor can give a verbal cue to students having difficulties especially when they are attempting to enter fast moving traffic from the side of the road. In addition, the instructor can have the student respond verbally to give him practice in gap estimation.

Entering Traffic From a Tight Parallel Parking Space

Entering traffic from a tight parallel parking space requires the driver to integrate very slow movements with sharp turning movements when there is a suitable gap in the traffic. The student driver must be able to back slowly while turning sharply toward the curb, then he must move forward slowly turning sharply toward the roadway. Some beginning drivers may experience difficulty with coordinating speed and directional control. In order to leave the parking space properly the student must have mastered brake and/or clutch control so that he can turn the wheel while moving very slowly.

The driver must have an awareness of the space that the car occupies so that he does not touch the bumpers of the cars to the front and/or rear.

Recognition of Surface Conditions and Entering Angle

A beginning driver will have difficulty recognizing the effects of surface conditions and entering angle on the time required to reach an appropriate speed, when attempting to enter traffic from the roadside. This knowledge must be applied when judging gap suitability.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	--	--
Chalkboard for in-car use	--	--
State Driver's manual	--	--

FILMS/FILMSTRIPS/SLIDES

Entering Traffic From the Roadside

Simulator Films

"Blending in Traffic,"* 20 minutes, color, AEtna Life & Casualty Co.

"A Drive in an Automatic Shift Car,"* 20 minutes, color, AEtna Life & Casualty Co.

"Safe Highway Driving,"* 16 minutes, color, AEtna Life & Casualty Co.

"You and the AEtna Drivotrainer System,"* 20 minutes, color, AEtna Life & Casualty Co.

"The Art of Turning,"* 26 minutes, color, Allstate Enterprises.

"You Take the Wheel,"* 22 minutes, color, Allstate Enterprises.

Leaving a Parking Space

Simulator Films

"ABC's of Parallel Parking,"* 19 minutes, color AEtna Life & Casualty Co.

"Angle Parking and Turning Maneuvers,"* 18 minutes, color, AEtna Life & Casualty Co.

"Special Driving Techniques,"* 16 minutes, AEtna Life & Casualty Co.

"Moderate Traffic,"* 26 minutes, color, Allstate Enterprises.

"Special Maneuvers,"* 28½ minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

Entering Traffic From the Roadside

Basic References

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivo-Trainer System,* film sections as follows "The Drivotrainer System," "Automatic Shift Car," "Blending in Traffic," and "Safe Highway Driving."

Allstate Insurance Company. *Allstate Good Driver Trainer System,* film booklets as follows: "You Take the Wheel" and "The Art of Turning."

Anderson, William G. *In-Car Instruction: Methods and Content,* pp. 184-187, 190-191.

Anderson, William G. *Laboratory Manual for Learning to Drive,* p. 11.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies,* pp. 83-84, 91.

Center for Safety Education, New York University. *Driver Education and Traffic Safety,* pp. 189-190.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 120-121.

McKnight, A. James, and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Description,* pp. 33-0 - 33-1.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives,* pp. 68-69.

Supplementary References

American Automobile Association. *Teaching Driver and Traffic Safety Education,* pp. 193-194.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education,* pp. 214-215.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Leaving a Parking Space

Basic References

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System*, film sections as follows: "Angle Park-Turn Maneuvers," "Parallel Parking," and "Special Driving Techniques."

Allstate Insurance Company, Allstate Good Driver Trainer System, film booklet, "Special Maneuvers."

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 392, 396-397.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies*, pp. 83-84, 91.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 153, 155.

McKnight, A. James, and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 35-8 - 35-9.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, pp. 82-83.

Supplementary References

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 230, 233.

American Automobile Association. *Teaching Driver and Traffic Safety Education*, pp. 193-194.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, p. 265.

Glenn, Harold T. *Youth at the Wheel*, pp. 188-190.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), pp. 36-37, 40-41.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, p. 227.

Lane Changing

The student should be able to change lanes at the appropriate time and in a manner that will minimize the chances of collision and disruption of traffic flow.

Whenever a driver changes from one lane of traffic to another, he creates a potential hazard to himself and to vehicles already in the lane he is entering. The general unexpectedness of a lateral move, coupled with the limited lateral vision of the lane changer, makes the maneuver particularly hazardous. Because of the danger, lane changes should be limited to situations where they are necessary—preparing for a turn or passing a slower vehicle—and not simply to gain a small advantage in traffic. The most critical factors in executing a safe lane change are (1) anticipating the need for the maneuver early, (2) warning others of intent to change lanes, and (3) making sure there is a sufficient gap in traffic.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws that pertain to changing lanes.

Research shows that improper lane change is involved in a significant number of highway accidents. Principal causes are failing to notice vehicles about to, or in the process of, passing in the adjacent lane and failure to signal a lane change.

Preparing for a Lane Change

Before beginning a lane change the driver should:

Determine legal restrictions on lane changing.

A solid line on the roadway indicates that changing lanes is prohibited, a broken line that the maneuver is permitted. A solid line and a broken line together indicate that the driver nearest the broken line is allowed to change lanes.

Check well in advance for traffic that might make the lane change hazardous.

The driver should use both rear and side view mirrors and should glance briefly over his shoulder so as to detect any vehicle in his "blind spot."

On multilane highways the driver should also watch for vehicles entering the adjacent lane from a far lane.

Use his directional signal or give a hand signal before initiating a lane change.

Studies have shown that in certain cases as few as 25 percent of drivers actually signal a lane change.

Changing Lanes

In changing lanes the driver should:

> Once having signalled, wait a second or two, in case he has not detected a driver in his intended lane, check over his left shoulder (the "blind spot"), and then move smoothly but quickly into the new lane.
>
> Accelerate slightly before initiating the lane change.
>
> > A slight increase in speed expedites the lane change. It will also reveal a vehicle to the rear that might have been in the "blind spot."

The student should know the skills required for changing lanes.

The driver must be able to determine if the distance and closing rate of following vehicles in other lanes as well as the traffic flow will give him a safe opportunity to change lanes. He must also judge the speed and distance of leading vehicles.

He must learn to keep under constant surveillance the traffic to his front, side, and rear and simultaneously maintain the car within its lane.

Finally, he must be able to accomplish the change in a smooth continuous movement with very slight steering corrections and accelerator reversals.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to change lanes.

Coordination of Surveillance and Steering Activities

Changing lanes is a fairly simple but potentially hazardous maneuver. It requires the driver to be aware of traffic to the front, rear, and sides and simultaneously to maintain directional control of the car. Student drivers have a tendency to make prolonged precautionary checks to the side and rear often turning their shoulders too far and causing the steering wheel to turn.

During these checks traffic and/or potential hazards to the front are not given the proper attention, and the car may drift from its intended path within the lane. The instructor should explain the hazards of incorrect surveillance and point out the correct procedure. Use of a brief glance in the mirror or a quick head turn should be emphasized. The instructor should be prepared to assist manually with the steering for students who continue to display improper surveillance to the rear and sides.

Estimating Closing Rate and Distance of Following Vehicles in Other Lanes

The purpose of checking the traffic to the rear and side is to determine if it is safe to begin moving into the adjacent lane. The inexperienced driver may not have much difficulty in checking traffic and maintaining directional control. However, he may experience difficulty in correctly assessing the safety of a lane change. Determining when it is safe to change lanes is a perceptual skill, based partially upon the driver's estimates of closing rate and distance of following vehicles in other lanes.

The instructor may use a limited form of "commentary driving" when teaching others the lane changing maneuver. With this technique, the student indicates when he is checking traffic and whether it is safe to change lanes by using short phrases, such as "traffic check to side," "clear" and "approaching car." If the student fails to see a potential hazard or indicates erroneously that it is safe to change lanes, the instructor will have time to warn the student and/or advise against the lane change by saying "No!"

The use of limited commentary driving should aid the student in judging whether it is safe to change lanes. With more experience behind the wheel the beginning driver should be able to make accurate estimates of closing rate and distance of following vehicles in other lanes.

Smooth Continuous Movement

Most of the problems the student driver will experience when changing lanes are associated with scanning and making assessments. A few drivers may still experience some difficulty making a smooth continuous movement into the intended lane. These drivers should be given additional practice in accelerating and steering until they are able to accomplish a lane change with very slight steering corrections and accelerator reversals.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	--	--
Chalkboard or traffic situation board for in car use	--	--

FILMS/FILMSTRIPS/SLIDES

Simulator Films

"A Driver in an Automatic Shift Car,"* 20 minutes, color, AEtna Life & Casualty Co.

"Expressway Excellence,"* 17 minutes, color, AEtna Life & Casualty Co.

"Perfect Passing,"* 17 minutes, color, AEtna Life & Casualty Co.

"Expressways are Different,"* 24 minutes, color, Allstate Enterprises.

"Intermediate Traffic,"* 22 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty Co., in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System,* film sections as follows: "Automatic Shift Car," "Perfect Passing," and "Expressway Excellence."

Allstate Insurance Company| *Allstate Good Driver Trainer System,* film booklets as follows: "Moderate Traffic," "Intermediate Traffic," and "Expressways are Different."

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

BASIC REFERENCES (Continued)

American Automobile Association. *Practice Driving Guide for Use with Sportsmanlike Driving,* p. 23.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 181-183.

Anderson, William G. *In-Car Instruction: Methods and Content,* pp. 174-192.

Anderson, William G. *Laboratory Manual for Learning to Drive,* p. 15.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies,* pp. 121-130.

Anderson, William G. *Teacher's Manual for Learning to Drive,* pp. 36-38.

Center for Safety Education, New York University. *Driver Education and Traffic Safety,* pp. 120, 166, 190-191, 204.

McKnight, A. James, and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 34.0 - 34.3.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives,* pp. 72-74.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers,* pp. 28-31.

Quane, W. Laurance, *Utilizing the Multiple Car Driving Range,* pp. 3, 11, 14, 25, 29, 32, 67.

SUPPLEMENTARY REFERENCES

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education.* p. 52.

Center for Safety Education, New York University. *Man and the Motor Car,* pp. 252-268.

Glenn, Harold T. *Youth at the Wheel,* pp. 214-218.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 91, 98, 122, 175, 222-223.

North American Professional Driver Education Association *The New Drivers Guide,* (Strasser/Aaron), pp. 32-33.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition,* pp. 82-83.

Parking

The student should be able to identify suitable parking places and maneuver into them with minimum risk of collision or disruption of traffic flow.

In leaving traffic, the driver is frequently confronted by restrictions as to where he can stop the car and restrictions imposed either by legal constraints or by the presence of other vehicles. These constraints give rise to the parking maneuver. While parking is not one of the more hazardous or critical driving tasks (despite the attention to it in some license examinations), there are elements of danger in (1) the distraction to and interrruption of traffic flow entailed in seeking a suitable place to park, (2) the interruption of traffic flow and danger of collision when maneuvering into a confined parking area, (3) the danger to passengers leaving the street side of a parked vehicle, and (4) the danger of the car moving or being moved if improperly secured.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws that pertain to parking.

Selecting a Suitable Parking Space

The initial step in the parking procedure is the selection of a suitable place to park. While he is looking for a place, the driver must not impede traffic unnecessarily; therefore, he should maintain a speed that approximates the posted limit. When he sees a likely space, he should signal to the vehicles behind him that he intends to slow down, using an arm signal. This gives him time to inspect the space for size as well as for any legal restrictions.

Restrictions on parking are fairly uniform from state to state, usually applicable to roadside traffic controls and such locations as crosswalks at intersections, safety zones, railroad tracks, fire hydrants, and fire stations. The driver should be familiar with these restrictions. Specifically, it is illegal to park a car:

Within 30 feet of a traffic light or sign located at roadside.

Within 20 feet of a crosswalk at an intersection (except momentarily to discharge or pick up passengers), to give right-turning vehicles space to turn into the curb lane.

Between a safety zone and the adjacent curb or within 30 feet of the rear side of a safety zone, except to avoid a traffic conflict. (Safety zones are intended for exclusive use of pedestrians.)

Within 15 feet of a fire hydrant.

Within 20 feet of a fire station entrance or within 75 feet across from a fire station entrance (except momentarily to discharge or pick up passengers).

Within 50 feet of the nearest railroad track.

Alongside curbs that are painted yellow.

Parking the Car

After locating a suitable parking space, the driver must signal the vehicles behind him that he intends to stop and enter the parking space. He must execute the procedure as quickly and efficiently as possible to minimize the danger of other vehicles and the delay to the flow of traffic. He will park either parallel along the curb or in an angular or perpendicular space.

Parallel Parking

When parking in a parallel space, the driver should:

Signal to traffic behind his intentions to stop.

If lanes permit, signal following traffic to pass before attempting to park.

Position the car alongside and about two feet from the vehicle in front of the selected parking space, with the wheels straight.

Back slowly, turning the steering wheel fully to the right and looking over the right shoulder and out the back window.

Straighten the steering wheel when the back of the front seat and the rear of the vehicle parked in front of the space are aligned.

Check for clearance with the parked vehicle, then look to the rear again.

Continue backing slowly, turning the steering wheel sharply to the left when the front bumper of the car clears the parked vehicle.

> "Creeping" into a parking space gives the driver more time for steering and for checking the car's position.

Straighten the wheels when the car is almost parallel to the curb and stop the car just short of the vehicle parked behind.

Center the car in the parking space a foot or less from the curb.

Turn the wheels sharply away from the curb on an upgrade, sharply toward the curb on a downgrade.

Angle Parking

When entering a parking space at an angle, the driver should:

Signal to traffic behind of intentions to turn left or right.

Position the car approximately six feet from vehicles already parked.

Turn the steering wheel sharply when the near line of the parking space is aligned with driver, at the same time maintaining a forward motion.

Check for sufficient clearance with the vehicles on either side of the parking space.

> When entering to the right, the driver should check the left front fender and right rear door for clearance, when entering to the left, he should check the right front fender and the left rear door for clearance.

Center the car in the space to allow room for opening doors.

Stop the car before the front tires touch the curb.

Parking on Hills

When parking on hills, the driver should:

Apply the parking brake before shifting to park position in automatic shift cars.

By applying the parking brake before shifting to the park position, the load on the transmission and parking mechanism can be reduced. (The procedure is reversed when parked on level roadways.) Movement of the gearshift lever from the park position when leaving the parking space will be easier if the "apply brake–shift to park" sequence is followed.

Shifting to park or reverse is imperative on hills to keep the car from coasting.

If there is a curb, turn the wheels sharply away from the curb when parked on an upgrade and sharply toward the curb on a downgrade, to hold the car in case the brakes or parking gear fail. If there is no curb, turn the wheels toward the side of the road on both upgrades and downgrades.

Post Parking Procedures

After parking, the driver should:

Place the gearshift level in park or, if the car is without a park position, in reverse.

Apply the parking brake firmly.

Turn off all electrically operated controls and accessories.

Some accessories will be turned off automatically when the engine is turned off. However, windshield wipers, if not turned off, may scratch the windshield if it is dry when the car is started again.

The lights and, in some cars, the radio are turned off automatically when the engine is turned off. If they are left on they will eventually drain the battery.

Turn off the ignition and remove the key.

Close all the windows.

Check for rear approaching traffic before opening the door if leaving the car by the street side when parallel parked.

The hazards of getting out of a car on the street side have prompted some states to forbid the opening of car doors on that side after parking.

Look for a vehicle entering an adjacent angle or perpendicular parking space before opening the door.

Perpendicular Parking

When the approach to a perpendicular parking space is unrestricted, the driver should:

Swing out as much as possible (but at least one car length) beyond the line of parked vehicles).

Begin turning when the front end is even with the near side of the parking space, turning the steering wheel sharply while maintaining a forward motion.

Check for clearance on both sides.

Center the car in the space, making sure there is room to open the doors.

Stop before the front wheels touch the curb.

When the approach to a perpendicular parking space on the right is restricted, the driver should:

Enter forward.

Drive past the parking space until the front bumper is in line with the far side of the next parking stall.

Back up while turning the steering wheel sharply to the left so that the car turns away from the parked vehicles.

Stop when the left front of the car is in line with the right side of the vehicle parked to the left of the space to be entered.

Drive forward and center the car in the space to allow room for opening doors.

When the approach to a perpendicular parking space on the left is restricted, the driver should reverse the direction of the movements listed above for a restricted approach to a perpendicular parking space on the right. In so doing, he should:

Back up while turning the steering wheel sharply to the right so that the car turns away from the parked vehicles.

Stop when the right front of the car is in line with the left side of the vehicle parked to the right of the space to be entered.

When backing into a perpendicular parking space where the approach is restricted, the driver should:

Pass the parking space and position the car about four feet out from the parked vehicles.

Stop when the back bumper is at the near side of the parking space, and look to the rear.

Back slowly while turning the steering wheel sharply so that the rear of the car enters the space.

Lock the car door after getting out of the car.

Securing the car (closing windows, removing the ignition key, and locking doors) will greatly reduce the chance of its being stolen. In about 80 percent of cars that are stolen, the drivers have left the doors unlocked.

The chance of stolen cars being involved in accidents is 200 times greater than for owner-driven cars.

The student should know the skills required to enable him to maneuver the car into a parking space.

To be able to pull the car into a parking space with minimum interruption to traffic flow, the driver must be able to make small, precise adjustments in steering, acceleration, and backing. Also involved are use of the clutch (in manual shift cars) and brake, and operation of the gearshift lever. These adjustments must be made quickly but with care to prevent damage to the car and adjacent vehicles.

The driver must be able to perceive that the size of the parking space is large enough for the car, approximately 1¼ car lengths. Attempting to maneuver into a parking space that is too small can tie up traffic for a considerable period of time.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to park.

Selecting Large Enough Parking Space

A beginning driver may have difficulty in selecting a parking space large enough to accommodate the car. There can be several reasons for this problem. First, he may not know how much space he really needs—the length of the car and the additional space needed for maneuvering. It is difficult to estimate space from a longitudinal axis, the space looks smaller than it really is. A parking space across the street, which the driver views more laterally, will look larger. The driver should check the size of the selected parking space by driving alongside it and comparing it with the length of the car, then add about one-quarter length for maneuvering. Practicing on a driving range or on a residential street where there is little or no traffic will help the student learn to judge the size of a parking space. Traffic cones, flags, or stanchions can be used to vary the size of parking spaces. Initially he should be encouraged to avoid tight parking places while driving in traffic.

Positioning the Car

An experienced driver may not correctly position the car within the space. He may park too far from the curb, creating a hazard to traffic flow. Or he may neglect to center the car in the parking space. This can make it difficult for other drivers to pull into the spaces to the front or rear of the car, or it can make it difficult for him to leave the parking space. The instructor should counsel the student driver to park the car no farther than 12 inches from the curb and to center the car laterally in the parking space.

Steering and Speed Control While Parking

A beginning driver may become confused in determining the direction to turn the steering wheel to make steering corrections while backing. He may also permit the car to move too fast, which allows him insufficient time for turning the steering wheel. The instructor should explain the importance of the brake and/or clutch in controlling the speed during the parking maneuver. He may want to recommend additional practice for the student on the driving range.

Inadequate Surveillance

Some beginning drivers may devote too much attention to positioning the car for parking and too little attention to scanning the area for potential hazards. Classroom instruction prior to behind-the-wheel instruction should point out the importance of both tasks in relation to parking. Instructor comment during behind-the-wheel training should be an additional reminder.

Distribution of Attention

Student drivers may have difficulty in appropriately dividing their attention to the front and back while backing during a parking maneuver. Classroom discussion should include an analysis of the parking maneuver and an identification of the critical points in the maneuver, including the need to check to the front and to the rear.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Classroom and traffic situation board	--	--
Chalkboard for in-car use	--	--
Handouts/pamphlets	American Automobile Assoc.	"How to Park—Every Time"
	National Safety Council	"How to Park Your Car"
State Driver's Manual	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Angle Parking," 8 mm, 3-4 minutes, color, McGraw Hill Book Company.

"Parallel Parking," 8 mm, 3-4 minutes, color, McGraw Hill Book Company.

"Parking on a Hill," 8 mm, 3-4 minutes, color, McGraw Hill Book Co.

"Basic Maneuvers II,"* 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

"Parking," filmstrip, 59 frames, b/w, General Motors Corp.

"Parking Tactics," 16 minutes, color, Charles Cahill Asso.,Inc

Simulator Films

"ABC's of Parallel Parking," 19 minutes, color, AEtna Life & Casualty Co.

"Angle Parking and Turning Maneuvers,"* 18 minutes, color, AEtna Life & Casualty Co.

"Road Check," 20 minutes, color, AEtna Life & Casualty Co.

"Special Driving Techniques,"* 20 minutes, color, AEtna Life & Casualty Co.

"Special Maneuvers,"* 28½ minutes, color, Allstate Enterprises.

"Shift for Yourself,"* 26 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System,* film sections as follows: "Angle Pack-Turning Maneuvers," "Parallel Parking," "Special Driving Techniques," and "Road Check."

Allstate Insurance Company. *Allstate Good Driver Trainer System,* film booklets as follows: "Special Maneuvers" and "Shift for Yourself."

American Automobile Association. *Practice Driving Guide for Use with Sportsmanlike Driving,* pp. 19-21.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 391-397.

Anderson, William G. *In-Car Instruction: Methods and Content,* p. 92, 94-95, 230-232.

Anderson, William G. *Laboratory Manual for Learning to Drive,* p. 21.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies,* pp. 34-35, 158-160.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objectives.

BASIC REFERENCES (Continued)

Anderson, William, G. *Teacher's Manual for Learning to Drive*, pp. 26-28.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 43-44, 56, 145, 152, 154, 166-167, 196-197, 272.

McKnight, A. James, and Adams, Bert B. *Driver Education Task Volume I: Task Descriptions*, pp. 35-0 - 35-7.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, pp. 76-80.

Quane, W. Laurance, *Utilizing the Multiple Car Driving Range*, pp. 13, 15, 17, 34-35, 70-71.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 229-234, 257-258.

American Automobile Association. *Sportsmanlike Driving: Teacher's Guide*, pp. 31-32.

American Automobile Association. *Teaching Driver and Traffic Safety Education*, pp. 210-211.

Boehlow, Robert H. "How I Teach Driver Education - Parallel Parking," *Safety*, November-December 1969.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, pp. 139-140, 232-236, 260-266.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 86, 32-33, 95-97, 206-207, 222-223, 252.

Glenn, Harold T. *Youth at the Wheel*, pp. 41-46, 187-190. 316-317.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 39-43, 179.

National Education Association, National Commission on Safety Education. *How Experienced Teachers Develop Good Traffic Citizens: Tips and Cues*, pp. 43-46.

North American Professional Driver Education Association *The New Driver's Guide*, pp. 21, 34-35, 38-39.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 88-94.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 151-152, 178, 226-230.

Emergency Areas

The student should know how to react when approaching an emergency area.

Because of the irregular movement of traffic in an emergency area, there is the possibility of other vehicles becoming involved in the emergency situation. The student should continue through the emergency area unless he is the first to arrive on the scene. In this event, he has a moral responsibility to stop and render assistance until police and emergency vehicles arrive. His response may decrease the severity of injuries and prevent other vehicles from becoming involved.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws for driving safely through or by an attended emergency area or for providing necessary assistance when he is the first to reach a severe accident.

Approaching/Driving Through Attended Emergency Area

When approaching and driving by or through the scene of an attended accident or emergency operation (fire, ambulance, and the like), the driver should:

Slow down in advance of the emergency area and prepare to stop, if necessary.

Watch out for traffic officers and other persons on the scene and for unexpected movement of vehicles on the roadway.

Look for flares and signals directing traffic through the area, and drive in these designated areas.

Continue without stopping or slowing down unnecessarily to view the scene.

An already poor traffic situation frequently becomes more difficult when drivers slow down to view an emergency area.

Drivers who slow down unnecessarily increase the possibility of being hit from the rear and creating a multiple-car accident.

Approaching Unattended Accident Scene

When approaching the scene of a severe unattended accident immediately after its occurrence, the driver should:

Stop in a safe place completely off the roadway so that his car does not impede traffic or the access of emergency vehicles to the scene.

Position flares or signals to warn other vehicles.

Administer first aid to the injured if necessary.

Contact police and necessary medical assistance if someone else hasn't already done so.

Remain at the scene until help arrives.

Provide information to the police and involved parties if he is a witness to the accident.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

McKnight, A. James, and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 36-20 - 36-21.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, pp. 88-89.

SUPPLEMENTARY REFERENCES

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 234-236.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 351-353.

"If There's Trouble on a Car Trip," *Changing Times*, August, 1964, p. 26, The Kiplinger Washington Editors Inc., Washington, D.C.

Driving by Parked/Parking Vehicles

The student should maintain sufficient surveillance to safely approach and pass vehicles parked alongside the roadway as well as vehicles in the process of parking.

Approaching and passing parked vehicles or a vehicle in the process of parking require the driver to take special safety precautions if a steady flow of traffic is to be maintained. Hazards are created not only by these vehicles and other motorists but by pedestrians who may appear from between parked vehicles or emerge from them. A knowledge of the potential hazards and ability to recognize cues which warn of these hazards will minimize the possibility of an accident.

DRIVING TASK REQUIREMENTS

The student should know the procedures and hazards involved in driving alongside parked or parking vehicles and be able to recognize the cues that warn of these hazards.

General

Because the driver's view is limited on roadways where vehicles are parked or in the process of parking, he should:

Watch for pedestrians or animals entering the roadway from in front of or between parked vehicles.

Drive at a slower than normal rate of speed.

Approaching Parked or Parking Vehicles

When approaching a parked vehicle, the driver should:

If the vehicle's hood is up, slow down and anticipate that the driver may step into the roadway.

Watch for vehicle doors to be opened or other cues that may indicate the occupants of the vehicle will exit on the roadway side.

Occupants of the vehicle should be warned of the car's approach by sounding the horn or flashing the lights.

Move to the left of the parked vehicle, but still remaining in the driving lane, to avoid striking the vehicle and/or its occupants.

Look for cues to indicate a parked vehicle intends to leave the parking space.

Cues may include smoke from the exhaust, hand signals from the driver, or activated turning signals, back-up lights, or brake lights.

When approaching a parking vehicle, the driver should:

Allow sufficient clearance ahead for the driver to complete his parking maneuver without being crowded.

Passing Parked or Parking Vehicles

When changing lanes to pass a vehicle that is about to enter or exit a parking space, the driver should:

Check traffic to the rear.

Ensure there is adequate clearance ahead.

Ensure that the vehicle's driver is aware of the car's presence before changing lanes.

When the vehicle is parallel parking, allow a full car width between the car and the parking vehicle.

The student should know the skills involved in driving alongside parked and parking vehicles.

Maintaining Lateral Distance from Parked Vehicles

The driver must develop the ability to use peripheral and central vision in order to keep the car within the driving lane yet maintain a safe distance from the parked vehicles.

Maintaining Steering Control While Checking Lateral Distance

The driver must be able to maintain precise steering control when passing parked vehicles in order to remain within the center of the driving lane while maintaining a safe distance from the parked vehicles.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to drive alongside parked or parking vehicles.

Maintaining Safe Lane Position

A beginning driver may have some difficulty in keeping the car within the driving lane while maintaining a safe distance from parked vehicles. This problem may exist because the student driver may not as yet have developed skill in using peripheral and central vision to estimate distance between his car and the vehicles parked on the roadway. This ability is necessary in order to steer the car along a safe path under these conditions.

Instruction on residential streets where vehicles are parked on the street and where traffic is light should help the beginning driver overcome this difficulty. When necessary the instructor should give the driver verbal cues for checking to the side of the car. Over a period of time the student driver should develop the ability to estimate how close his car is to parked vehicles while maintaining position within the driving lane.

Driving Too Close to Parked Vehicles

An inexperienced driver who frequently drives too close to parked vehicles has not yet developed the ability to estimate lateral distance. In addition, he may not be familiar enough with the size of the car he is driving to realize that he is too close to vehicles parked along the roadway. He may require several hours of practice before he begins to develop an appreciation for the space his car occupies. The driver must become familiar with the space to the front, rear, and sides. Once this ability, and the ability to estimate distance from the car side to a parked vehicle, are developed he will experience less difficulty in driving down roadways with parked vehicles.

Other Common Problems

Failure to reduce speed when approaching or driving alongside parked vehicles.

Failure to observe cues and indications that a vehicle is about to leave a parking space.

Failure to check to the rear and side when making a lane change while in the process of passing a parked vehicle.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	–	–

FILMS/FILMSTRIPS/SLIDES

Simulator Films

"Intermediate Traffic,"* 22 minutes, color, Allstate Enterprises.

"Perceptive Driving,"* 23 minutes, Allstate Enterprises.

"Road Check,"* 20 minutes, color, AEtna Life & Casualty Co.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

BASIC REFERENCES

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivetrainer System,* film sections as follows: "Road Check," "IPDE," "Separating and Compromising Risks," and "Crash Avoidance."

Allstate Insurance Company. *Allstate Good Driver Trainer System,* film booklets as follows: "Moderate Traffic," "Intermediate Traffic," and "Hazardous Situations."

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* p. 182.

Anderson, William G. *In-Car Instruction: Methods and Content,* p. 106.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* p. 176.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis, Volume I: Task Descriptions,* p. 36-0.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives,* pp. 90-91.

Overtaking

The student should be able to overtake characteristically slow-moving or stopped vehicles, provided the procedure is lawful and justifies the risks involved.

Many types of vehicles use the highways, including some that characteristically do not move very fast or stop frequently—farm vehicles, underpowered vehicles, heavily-loaded trucks, and school buses, for example. There is a justifiable reason for overtaking such vehicles, provided the law does not prohibit it—and the reason is that the lead vehicle may be moving so slowly it is creating a hazardous situation. Vehicles pile up behind slow-moving traffic until following drivers begin to take unnecessary chances to overtake and pass.

There are risks involved in overtaking slow-moving vehicles and vehicles that are stopped on or along the roadway. The driver must take care that the maneuver is legal and will serve a useful purpose.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws that pertain to overtaking another vehicle.

Overtaking Characteristically Slow-Moving Vehicles

In overtaking characteristically slow-moving vehicles as well as vehicles with normal accelerative capability that reduce their speed to turn, exit or enter a roadway, before crossing railroad tracks, and the like, the driver should:

Prepare to reduce speed.

Signal to traffic behind his intentions to slow down.

Select one of the following actions:

Pass the vehicle if permitted by law and/or traffic conditions.

Stay behind the vehicle, matching its speed and maintaining an adequate separate distance.

Reduce speed and remain a sufficient distance behind the vehicle.

Overtaking Stopped Vehicles

When overtaking a stopped vehicle, the driver should:

Watch for passengers to leave the stopped vehicle.

Anticipate that the vehicle might turn suddenly.

Observe traffic approaching from the front and rear before attempting to pass the vehicle.

Sound the horn at the stopped vehicle as a warning of his intentions to pass.

Avoiding a Collision With a Stopped Vehicle

If there is insufficient distance to stop before colliding with a stopped vehicle, the driver should.

Attempt evasive steering or passing, if traffic permits.

Avoid hard braking which might result in a skid or loss of control.

The student should know the skills required for overtaking slower-moving vehicles.

Estimation of the Closing Rate

The driver must be able to judge the rate at which his car is closing with the vehicle ahead in order to adjust his speed or initiate a pass at the proper time. He must learn to associate the rate of speed with perceptual cues which indicate a shortening of the distance between the car and the vehicle ahead.

The primary perceptual cue in the daytime is the change in apparent size of the lead vehicle, at night the cue is the distance between the taillights.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to overtake slower vehicles.

Estimation of Closing Rate

Beginning drivers tend to brake rapidly and/or firmly instead of gradually coming upon and overtaking a vehicle. The driver may not yet have developed skill in estimating the rate at which the car he is driving closes on the vehicle ahead. The instructor should cue the student driver to begin braking if he observes that the student is unable to make perceptual estimations of closing distance. In addition, the instructor should identify some of the cues that can be used for judging the rate of closure such as the change in apparent size of the lead vehicle during daytime and the distance between the taillights at night.

Other Common Errors

Failure to reduce speed when overtaking vehicles that characteristically move slowly or that are moving slowly in anticipation of some driving maneuver.

Improper surveillance, when overtaking a stopped vehicle, of the vehicle itself, of passengers leaving the vehicle, and of surrounding traffic.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	--	--

FILMS/FILMSTRIPS/SLIDES

Simulator Films

"Blending in Traffic,"* 20 minutes, color, AEtna Life & Casualty Co.

"Expressway Excellence,"* 17 minutes, color, AEtna Life & Casualty Co.

"Perfect Passing,"* 17 minutes, color, AEtna Life & Casualty Co.

"Road Check,"* 20 minutes, color, AEtna Life & Casualty Co.

"Hit the Highways,"* 23 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System,* film sections as follows: "Blending in Traffic," "Perfect Passing," "Expressway Excellence," "Road Check," "IPDE," and "Decision is Yours."

Allstate Insurance Company. *Allstate Good Driver Trainer System,* film booklet, "Hit the Highways."

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 183-184.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies,* pp. 131-135.

Center for Safety Education, New York University. *Driver Education and Traffic Safety,* pp. 161-162, 191-192, 204.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 36-10 - 36-13.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives,* pp. 104-106.

SUPPLEMENTARY REFERENCES

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 121, 186, 194, 200, 367.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), pp. 56-57, 61.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Special Vehicles

The student should know how to react when there are special vehicles, including school and public transit buses, convoys, and emergency vehicles, in the vicinity.

To be able to respond safely to special vehicles, including school and transit buses, vehicles in a convoy or procession, and emergency and police vehicles, the driver must know the state and local laws that pertain to them. The high speed of ambulances, fire trucks, and other emergency vehicles may create hazardous traffic situations, as well as delays in the vehicles reaching the emergency scene, if drivers do not obey the law and grant these vehicles the right of way.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws that pertain to driving in the vicinity of special vehicles.

Special vehicles include school buses, public transporation vehicles, emergency vehicles, and vehicles in a procession or convoy. When driving in areas where these types of vehicles are present, the driver should be extremely cautious, yielding the right-of-way as required by law or in the interest of safety.

Reacting to School Bus and Emergency Vehicles

When following or approaching a school bus, the driver should

Look for indications that the bus is preparing to stop.

The bus driver will indicate he is preparing to stop by activating the flashing amber lights or the brake lights.

Groups of children waiting at the roadside or signs designating a bus stop are further indications that the bus is preparing to stop.

Slow down and come to a complete stop if the bus is coming to a stop in the roadway in either direction to load and unload passengers.

Drivers are required by law to stop when the bus's flashing red lights and/or mechanical arm are activated, or when the bus door is open.

Most states waive this requirement when the school bus is on the other side of a roadway with a median divider (preventing the children from crossing the roadway).

Remain stopped until the bus's signals have been turned off or the bus proceeds and all children have cleared the traffic area.

If an ambulance, fire truck, police car, or other emergency vehicle is approaching from any direction, the driver should

Pull over to the curb or shoulder and stop.

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Clear an intersection before stopping to avoid blocking it.

Proceed when sure that all of the emergency vehicles have passed.

When a siren is heard but the emergency vehicle is not visible, the driver should:

Slow down and open the window to locate the direction of the siren.

Stop and check left and right before proceeding through an intersection.

When a police vehicle with its signals on is following the driver, he should:

Pull over to the right side of the roadway as soon as it is safe to do so, and stop.

When approaching a vehicle with flashing red or yellow lights, the driver should:

Slow down and prepare to stop if required.

A distance of at least 500 feet should be maintained between the car and the emergency vehicle ahead.

Other emergency vehicles, perhaps behind the car, should be anticipated.

Watch the roadway beyond the emergency vehicles for obstacles or disturbances, slow-moving or stopped vehicles, and officials and pedestrians on the scene.

Reacting to a Convoy

When encountering a funeral procession or other type of convoy, the driver should:

Yield the right of way to all the vehicles in the convoy.

Refrain from cutting into the line of procession.

Approaching a Bus Stop

When approaching a bus stop, the driver should:

Watch for pedestrians approaching to board the vehicle.

When the stopped bus is discharging passengers, stop before reaching the bus and remain stopped until the vehicle proceeds and all passengers have reached safety.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--

FILMS/FILMSTRIPS/SLIDES

School Buses

Simulator Films

"IPDE,"* color, AEtna Life & Casualty Co.

"Road Check,"* 20 minutes, color, AEtna Life & Casualty Co.

"Special Driving Techniques,"* 16 minutes, color, AEtna Life & Casualty Co.

"Complex Traffic,"* 24 minutes, color, Allstate Enterprises.

Emergency Vehicles

Simulator Films

"Blending in Traffic,"* 20 minutes, color, AEtna Life & Casualty Co.

"Road Check,"* 20 minutes, color, AEtna Life & Casualty Co.

"Drive in Review,"* 27 minutes, color, Allstate Enterprises.

"Intermediate Traffic,"* 22 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

Emergency Vehicles/Processions or Convoys

Basic References

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System,* film sections as follows: "Blending in Traffic," and "Road Check."

Allstate Insurance Company. *Allstate Good Driver Trainer System,* film booklets as follows: "Intermediate Traffic" and "Drive in Review."

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 114-115.

Center for Safety Education, New York University. *Driver Education and Traffic Safety,* pp. 168-169, 193-194.

McKnight, A. James, and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 36-14 - 36-17.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives,* pp. 108-110.

Supplementary References

Center for Safety Education, New York University. *Man and the Motor Car,* pp. 211, 257.

Glenn, Harold T. *Youth at the Wheel,* P. 166.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively,* p. 273.

School and Public Transit Vehicles

Basic References

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System,* film sections as follows: "Special Driving Techniques," "Road Check," and "IPDE."

Allstate Insurance Company. *Allstate Good Driver Trainer System,* film booklet "Complex Traffic."

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 184-185.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Basic References *(Continued)*

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, p. 168.

McKnight, A. James, and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 36-12, 36-14 - 36-17.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, pp. 108-110.

Supplementary References

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 211, 321.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, p. 64.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 123-127.

Negotiating Intersections

The student should know how to approach and proceed through an intersection, with attention to traffic and traffic controls.

To negotiate an intersection the driver must make decisions on speed, lane selection, and braking, all the while checking the surrounding traffic and watching for traffic signals placed at intersections to facilitate the flow of traffic.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws that pertain to negotiating intersections.

Approaching Intersection

In approaching an intersection the driver should:

Decelerate gradually but not too early.

Decelerating too early delays following traffic and could cause a rear-end collision when following drivers are not expecting the car to slow down.

Decelerating too early may cause following drivers to become irritated and initiate an unsafe pass.

Deceleration should begin early enough to permit the driver to avoid stopping in the intersection or crosswalk, which is illegal in many states.

Enter the correct lane as early as possible, but no later than 100 feet prior to the intersection.

Some states require drivers to enter the correct lane no later than 100 feet before reaching the intersection.

The car's position in relation to the lanes is a clue to other vehicles of the intentions of the driver.

Signs generally provide drivers with lane information.

Failure to enter the correct lane soon enough to negotiate a desired turn safely is a primary cause of a significant number of accidents.

If the driver is proceeding through the intersection, he should enter the center lane (unless otherwise directed) or the left of two lanes.

Use of the center lane avoids conflict with right- and left-turning traffic.

If the driver plans to make a right turn, he should enter the far right lane (unless otherwise directed).

If the driver plans to make a left turn, he should enter the far left authorized lane (unless otherwise directed).

Signal, if intending to turn, by hand or by activating the appropriate directional signal.

Failure to signal or to provide adequate signal is a contributing factor in many accidents each year.

The signal should be given as soon as possible without causing confusion and no later than 100 feet prior to the intersection, in accordance with the law prevailing in most states.

Approaching and Traversing Intersection

In approaching and traversing an intersection, the driver should:

Observe the traffic controls or the traffic officer.

When the traffic controls and the directions from the traffic officer conflict, the officer's directions should be followed.

A stop sign requires the driver to come to a full stop, then proceed through the intersection only when he will not interfere with cross traffic.

At most intersections stop or yield signs are opposite each other, but they may also be at right angles.

Failure to honor a stop sign and/or yield sign to all cross traffic before proceeding past the stop sign is a major factor in a significant number of accidents each year.

The car's left door post creates a blind spot. Coming to a full stop permits approaching vehicles to emerge from behind the blind spot.

A yield sign requires the driver to reduce speed and check cross traffic. He may proceed through the intersection only when he will not interfere with cross traffic.

Failure to yield the right of way is the driver error that most often causes accidents.

A red traffic light requires the driver to stop until the light is green. He should not anticipate the green light by moving forward on the yellow light.

Starting before the green light appears will interfere with cross traffic. Many traffic lights now use the yellow light only before the red light.

In a significant number of accidents, impact occurs after the driver proceeds into the intersection through red or yellow lights.

A green light or flashing yellow light permits the driver to enter the intersection after checking for cross traffic.

An estimate of the length of time the prevailing light has been or should be made, if possible, so that a change in the light can be anticipated.

If the light changes from green to yellow, indicating generally that the red light will appear shortly, two options are open:

The driver may decelerate and prepare to stop.

He may proceed through the intersection if he cannot make a full stop prior to the intersection, or if stopping short of the intersection will cause conflict with following vehicles.

The first three seconds after the light changes are the most dangerous.

A flashing red light requires the driver to come to a complete stop before entering the intersection after checking for cross traffic.

A green arrow warns the driver to proceed only in the direction indicated by the arrow.

In approaching and traversing an intersection, the driver should also:

Observe any vehicle approaching from the left.

Looking for traffic from the left first is advisable since that traffic presents the greater threat by passing the car's path at a closer distance.

If both the car and the vehicle are on major roads, the driver should observe the vehicle for indications of deceleration and should prepare to stop if the vehicle does not yield the right of way. The driver may yield the right of way if it will facilitate the flow of traffic.

If the car is on a minor road, the driver should estimate the distance and speed of the approaching vehicle. If it is fast approaching the intersection, the driver should prepare to stop and yield the right of way. If the vehicle is signaling for a right turn, the driver should decelerate and prepare to enter the intersection only after the vehicle has begun its turn.

Observe any vehicle approaching from the right.

Observing the path of any vehicle approaching from the right will help the driver to determine if he will have to make a forced stop.

An estimate of the distance and speed of the approaching vehicle should be made.

When the car and vehicle reach the intersection at the same time, the vehicle from the right is permitted to continue since it is the first to clear the two vehicles' line of intersection. This rule applies only when there are no other traffic controls.

Removing the foot from the accelerator and covering the brake pedal provide an extra margin of reaction time to respond to the driver who is not obeying the rules. Never assume the other driver will yield.

If the vehicle is close and fast approaching the intersection, the driver should slow down or stop to permit the vehicle to clear the intersection.

Drivers are more accurate in predicting the time that fast vehicles from the side will reach the intersection than for slow vehicles.

Assurance of being able to get completely through the intersection without having to stop will help keep traffic flowing smoothly.

Blocking traffic because of failure to complete passage of the intersection is illegal in some cities.

Observe oncoming traffic.

At uncontrolled intersections and those with four-way stops, the driver who first reaches and stops at the intersection is permitted to continue.

Observing oncoming traffic will alert the driver to indications that a vehicle may turn left and will give him time to stop.

Observe left-turning vehicles in the intersection to be prepared to stop if the vehicle does not complete the turn or to permit the vehicle to complete the turn.

Observe traffic ahead.

By observing the traffic ahead, the driver will be prepared to stop if the lead vehicle should stop suddenly.

The driver should not enter the intersection unless the traffic ahead will permit him complete passage.

Observe pedestrians.

If pedestrians are near the corner, speed should be reduced and extra caution taken in forward motion.

The driver must stop, if necessary, to avoid pedestrians in the street.

When approaching and traversing an intersection, the driver should also:

If vision is obscured, stop at the intersection, then edge forward slowly.

A significant number of accidents occurs at intersections where vision is obstructed or limited by buildings, vegetation, or parked vehicles.

Roadside features obscuring the driver's vision are clues to stop at intersections.

If unable to enter the correct lane for turning, proceed to the next intersection.

Stop before reaching the crosswalk to allow pedestrians to cross unhampered by the car.

Proceeding Through Intersection

In general, when proceeding through an intersection, the driver should:

Avoid route changes while he is in the intersection.

When the signal for a turn is given, the turn should be completed. If no signal is given, a turn should not be made—because the maneuver will not be expected by other drivers.

Loss of control of the car may result if a turn is made suddenly without prior deceleration.

If a route change is necessary, it should be made at the next intersection with the appropriate signals being given.

Avoid stopping in the intersection.

Stops should be made in an intersection only when required by traffic.

When proceeding directly through the intersection, the driver should:

Check cross traffic.

More than 10 percent of the collisions at intersections could be avoided if drivers checked cross traffic before traversing the intersection.

Yield the right of way as required by law or for safety (See Approaching Intersection).

Observe traffic preparing to turn left.

Left-turning vehicles may be given the right of way when traffic behind the turning vehicle is heavy and traffic behind the car is light. Yielding the right of way under these circumstances generally facilitates traffic flow and may prevent an impasse—e.g., traffic ahead stopped by the vehicle attempting to turn left across oncoming traffic.

Wait until there is a gap of sufficient size to permit complete passage across the intersection.

If a vehicle suddenly appears from the left when the driver is traversing the intersection, the driver should:

Accelerate rapidly to get out of the way, or swerve sharply to the right to reduce the impact angle.

A significant number of accidents could be avoided or the severity reduced if the driver of the car swerves right instead of braking and maintaining course.

If a vehicle approaches rapidly from the right when the driver is traversing the intersection, the driver should:

Accelerate rapidly to get out of the way.

Stopping in the direct path of the vehicle should be avoided. Attempting to stop if the stop cannot be made before entering the path of the vehicle should also be avoided.

In turning right at the intersection, the driver should:

Observe traffic controls as described above in Approaching and Traversing Intersection.

Check cross traffic.

A check to the left should be made to judge the distance from the nearest vehicle.

When a line of traffic is approaching, a gap of sufficient size is required before proceeding.

A check to the right should be made to see if there is a vehicle in the intended lane.

Position the car for the turn so that it can clear the corner yet remain within the intended lane.

The car should be close enough to the curb or parked vehicles to prevent a following vehicle from passing on the right.

Complete the turn.

The turn should be made by the hand-over-hand technique into the transit lane closest to the curb.

Shifting should be avoided during the turn.

The turn should be sharp enough to avoid encroaching on the left lane but not so sharp as to cause the right rear wheel to cut the corner.

A speed between 5-15 miles per hour should be maintained unless traffic requires a speed of less than 5 miles per hour.

There should be a slight acceleration during the turn since excessive speed reduction during the turn interrupts the flow of traffic, causing delay and increasing the chance of a rear-end collision.

In turning left at the intersection, the driver should:

Observe traffic controls as described above in Approaching and Traversing Intersection.

Check cross traffic from both directions.

Wait for a sufficient gap in traffic from both the left and right to permit the turn to be made without danger.

Avoid pulling halfway into the intersection if it would interfere with cross traffic.

If there is no oncoming traffic, pull partially into the intersection and begin the turn before reaching the center of the cross street.

The turn should be made into the far left lane in the direction of intended travel, then the car steered into appropriate lane for normal driving.

If there is oncoming traffic stopped at the intersection when the driver wishes to turn left, the driver should:

On a green arrow:

Proceed to make the left turn across the path of oncoming traffic as indicated directly above for "no oncoming traffic."

Prepare to stop before turning left if the green arrow disappears.

On an advanced green light:

Turn across the path of oncoming traffic immediately after the light has turned green.

"Advanced green" means that oncoming traffic is stopped during the initial portion of the green cycle.

Check to make sure that oncoming traffic has not anticipated the green light.

Oncoming traffic may have reacted to the end of the cross traffic's yellow cycle rather than waiting for the green light.

Prepare to stop if oncoming traffic moves forward, indicating termination of the advanced period.

On a delayed green light:

Wait until oncoming traffic has stopped, indicating the beginning of the delayed period.

Turn left across the path of oncoming traffic.

If there is oncoming traffic approaching the intersection when the driver wishes to turn left, the driver should:

Proceed through the intersection if this action does not impede the progress of oncoming traffic.

If the oncoming traffic is close, proceed to the center of the intersection, remaining to the right of the center line with the wheels pointed straight ahead and the foot on the brake.

Proceeding to the center of the intersection allows the left turn to be completed more quickly when traffic permits.

Keeping the wheels straight ahead instead of turned to the left, and keeping the foot on the brake prevent the car from being pushed into oncoming traffic if struck from behind.

Wait until the oncoming traffic has traversed the intersection.

Failure to yield to oncoming traffic prior to initiating a left turn at an intersection is a factor in a significant number of accidents.

Reassess oncoming traffic for an acceptable gap.

The cross street to the left should be checked to make sure it is clear of pedestrians and vehicles. This prevents the driver being forced to stop into the line of oncoming traffic.

If an oncoming vehicle is signaling a turn toward the driver's right when the driver wishes to turn left, he should:

Proceed partially into the intersection and stop, remaining to the right of the center line with the wheels pointed straight ahead, the foot firmly on the brake.

Observe the oncoming vehicle to verify the turn, because his signal for a left turn may be in error.

Once the oncoming vehicle has stopped or indicates his intention to stop, the driver should:

Stop in advance of the oncoming vehicle, leaving sufficient heading to complete the turn.

Two left-turning vehicles should cross in front of one another rather than behind. This allows two lines of traffic to complete turns without interfering with one another.

Pause and observe any traffic passing to the right of the oncoming vehicle.

If there is through traffic, the driver should yield to it.

The cross street to the left should be checked for pedestrians or vehicles.

If the oncoming vehicle is signaling a turn toward the driver's left when the driver wishes to make a left turn, the driver should:

Proceed partially into the intersection and stop until the oncoming vehicle begins its turn.

The oncoming vehicle's right turn signal may be in error, or the driver may change his mind.

Turn left into the nearest left lane of the cross street, after the other vehicle has completed its turn.

The student should know the skills required for negotiating intersections and responding to traffic and traffic controls.

Estimating When It Is Safe to Proceed

When proceeding through an uncontrolled intersection and not having the right-of-way, the driver must be able to judge whether he can clear an intersection ahead of cross traffic. This judgment depends on his ability to (1) estimate the speed and distance of an oncoming vehicle(s) and the time that is available before the first vehicle arrives ("lag") or between two approaching vehicles ("gap"); and (2) estimate the amount of time needed to cross the intersection.

Coordinating Speed and Directional Control

The driver must also be able to coordinate speed and directional control activities with attempts to detect possible hazards when approaching or proceeding through an intersection. Coordination may not be difficult to achieve in lightly travelled areas such as residential areas, although the presence of children and animals still requires the driver to constantly scan the environment while driving. In urban areas, coordination of surveillance and control activities is more demanding.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to negotiate intersections.

Noting/Responding to Traffic Controls

A beginning driver may have a tendency not to notice, or may fail to respond to, traffic signs and signals at an intersection. This difficulty may occur at the start of on-street driving and continue through the later instructional period. When this problem occurs the instructor should note the acceleration-deceleration habits of the student on his approach to the intersection. If he appears to continue to accelerate beyond the point where he should begin to brake, the instructor should tell him immediately that a signal is coming up, then make sure the student responds accordingly.

Determining Time and Space for Turn at Intersection

One of the most dangerous learning problems for a new driver is determining whether he has enough time and space to make a left turn across the path of oncoming traffic. He may start the turn, then discover the gap is not large enough. The instructor should prevent this situation from occurring by emphasizing the importance of being certain the path is clear before he begins the turn. He may also encourage the student to tell him when it is safe to start turning, then do so with the instructor's approval. Practice in gap estimation may be provided by stopping at the corner and timing gaps between vehicles that pass. Generally, a 6-7 second gap will be required for a right turn and an 8-9 second gap for a left turn.

Positioning the Car in the Intersection for Turn

A beginning driver may have difficulty in knowing where to position the car for a turn at an intersection. This may be due to the lack of reference points in the center of the intersection. The result is that the new driver turns too early or too late. The instructor should tell the student immediately that he turned early or late and have him practice until he knows what the position of the car should be in the intersection for the turn.

Problems Related to Steering/Turning

Learning problems associated with steering and turning may also apply to negotiating intersections. Excessive speed, rigid use of the hand-over-hand technique, and late recovery when turning should be anticipated when a student driver begins practice in approaching and proceeding through an intersection. A new driver may also have difficulty scanning ahead to observe traffic ahead, oncoming traffic, and cross traffic. He tends to look directly in front of the car. The instructor should caution the student to look along the intended path, whether it's a straight path or a turning path.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	--	--
Chalkboard and traffic situation board for in-car use	--	--
Handouts/pamphlets	National Safety Council	"Crossroads Crash" "Traffic Control Devices" data sheet

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Basic Intersection Maneuver," filmstrip, 35 frames, color, Ford Motor Co.

"Intersection Maneuver - Right of Way," filmstrip, 40 frames, color, Ford Motor Co.

"Intersection Maneuver - Through Signal," filmstrip, 15 frames, color, Ford Motor Co.

"The Crossroads Crash," No. 5, Techniques of Defensive Film Series, 7-10 minutes, color, National Safety Council.

"Intersection Safety," 10 minutes, color, National Safety Council.

"Intersection Controls," filmstrip, 67 frames, b/w, General Motors Corp.

"Where They Meet," 35 mm filmstrip, 14 minutes, color, Bureau of Safety.

Simulator Films

"Blending in Traffic,"* 20 minutes, color, AEtna Life & Casualty Co.

"Road Check,"* 20 minutes, color, AEtna Life & Casualty Co.

"Special Driving Techniques,"* 16 minutes, color, AEtna Life & Casualty Co.

"Traffic Strategy,"* 16 minutes, color, AEtna Life & Casualty Co.

"The Art of Turning,"* 26 minutes, color, Allstate Enterprises.

"Complex Traffic,"* 24 minutes, color, Allstate Enterprises.

"Moderate Traffic,"* 26 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide materials for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System,* film sections as follows: "Blending in Traffic," "Traffic Strategy," "Special Driving Techniques," "Road Check," "IPDE," and "Separating and Compromising Risks."

Allstate Insurance Company. *Allstate Good Driver Trainer System,* film booklets as follows: "The Art of Turning," "Moderate Traffic," and "Complex Traffic."

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 115, 178-181.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies,* pp. 139-143, 149-151.

Anderson, William G. *Teacher's Manual for Learning to Drive,* pp. 49-52.

Center for Safety Education, New York University. *Driver Education and Traffic Safety,* pp. 162-165, 226-227, 233, 262-265.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 41-0 - 41-9.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives,* pp. 112-118.

Quane W. Laurance, *Utilizing the Multiple Car Driving Range,* pp. 9, 12, 27, 29-30, 32.

SUPPLEMENTARY REFFRENCES

Automotive Safety Foundation. *A Resource Curriculum In Driver and Traffic Safety Education,* pp. 55-56.

Center for Safety Education, New York University. *Man and the Motor Car,* pp. 205-206, 252, 268-269.

Glenn, Harold T. *Youth at the Wheel,* pp. 163-165, 251-254.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 63-66, 126-131.

North American Professional Driver Education Association, *The New Driver's Guide* (Strasser/Aaron), pp. 28-29.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition,* pp. 120-121.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively,* p. 181.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Traffic Circles

In negotiating traffic circles, the student should select the correct lane and observe the path of other vehicles so that he does not impede traffic.

Traffic circles are designed to expedite traffic at points where several roadways converge. Such a situation is characteristic primarily of older roadway systems and traffic circles are found primarily in the East. Beginning drivers at first may find them confusing until they learn the traffic patterns and are able to judge gap or lag while maintaining steering control and observing traffic carefully. Not knowing which lane to be in may create a bottleneck which defeats the purpose of a traffic circle.

DRIVING TASK REQUIREMENTS

The student should know the procedures and regulations for netotiating traffic circles.

Negotiating Traffic Circles

In negotiating a traffic circle the driver should:

Enter the circle in a counterclockwise direction, yielding to vehicles already in the circle.

If vehicles already in the circle are unable to continue or exit freely, the flow around the circle will be obstructed.

Traffic circles are designed to slow down traffic and keep all traffic moving to the right of the circle.

The outside lane of the traffic circle should be used by drivers traveling less than halfway around the circle.

The inside lane should be used by drivers traveling more than halfway around the circle.

Leave the traffic circle by the outside lane, entering this lane in advance of exit.

Traffic must be watched carefully during the maneuver to get into the exit lane.

The student should know the skills required for negotiating traffic circles.

Coordinating Surveillance, Steering, and Speed Control

Negotiating traffic circles is a difficult maneuver because the driver must concentrate on several tasks simultaneously. While watching for other traffic leaving the circle, the driver who intends to enter the circle must also give attention to steering and speed control. He must also be able to judge "gap" or "lag" as in a right-hand turn. He frequently may have to "sift through" traffic to move to the inside or outside of the circle. The judgment of gaps at this point resembles more the lane change or on-ramp problem in that it must be done over the shoulder or through a mirror while attending to the path ahead.

When leaving the circle the driver again must judge when it is safe, coordinating steering and speed control while observing traffic entering the circle.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to negotiate traffic circles.

Coordinating Surveillance, Steering, and Speed Control Activities

Student drivers can be expected to have difficulty entering, maneuvering within, and leaving traffic circles because they must concentrate on several tasks simultaneously. Traffic mix exercises on a multiple car driving facility should be used to provide student drivers with practice in coordinating steering and speed control activities with the surveillance activities required for safely negotiating traffic circles. During on-street instruction the instructor should use verbal cues to aid students, gradually withdrawing the cues as they become more proficient.

Lane Selection

Student drivers frequently select the improper lane in a traffic circle, particularly when they wish to leave the circle. In attempting to overcome that problem an instructor should demonstrate negotiating a traffic circle, commenting on the procedures during the course of the demonstration. When students practice the maneuver the instructor should provide verbal cues, reducing the frequency of the cues as performance improves.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	--	--
Chalkboard or traffic situation board for in car use	--	--

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

McKnight, A. James, and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 41-14 - 41-15.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 126-127.

Quane, W. Laurance, *Utilizing the Multiple Car Driving Range*, pp. 15, 18-19, 36-37, 72.

SUPPLEMENTARY REFERENCE

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, p. 132.

On-Ramps

The student should know the importance of the on-ramp as a characteristic of the freeway system.

At each freeway or limited access interchange an access or on-ramp is provided to permit the driver to enter the main roadway at minimum risk. The beginning driver should learn to take advantage of the strategy of the on-ramp, which is designed to meet the special demands of the freeway system.

DRIVING TASK REQUIREMENTS

The student should know the procedure and hazards that pertain to the use of on-ramps.

While on-ramps are less dangerous than off-ramps, they still account for about 5 percent of all freeway accidents. Most dangerous are ramps without acceleration lanes and those entering on the left side speed lane.

Approaching and Entering On-Ramp

In approaching and entering an on-ramp, the driver should:

Look for "wrong way" and "do not enter" signs prohibiting entry on the ramp.

Many fatalities occur each year because of wrong way driving on freeway ramps.

Observe the posted speed limit, checking for signs to reduce speed or to yield to other vehicles.

When entrance speeds are high and where acceleration lanes are short, on-ramps will have a high accident rate.

Observe the general configuration of the on-ramp/main roadway to determine the following:

Whether the on-ramp feeds into the right side or left side of the main roadway.

Whether there is an acceleration lane at the end of the on-ramp.

Whether any off-ramps or deceleration lanes cross over or share continuing portions of the on-ramp.

Whether the configuration of the on-ramp/main roadway affects the available merging distance and probable merging pattern.

Survey traffic on the main roadway by looking over the left shoulder if entering the main roadway from the right, and over the right shoulder if entering the main roadway from the left.

Using the mirrors to check on traffic will give the driver further assurance on traffic conditions.

Before attempting to merge, check the location and speeds of lead vehicles on the on-ramp or acceleration lane.

Make initial adjustment in speed, based on traffic and configuration of the ramp and main roadway.

If no traffic is present, continue on the on-ramp and enter the main roadway.

When traffic is present, prepare to merge by using the on-ramp to accelerate to the speed of traffic on the main roadway if possible, checking the traffic ahead on the ramp and being prepared to stop or slow down if necessary.

When acceleration lanes are short, drivers tend to stop at the end of them rather than using them for acceleration. Thus, on-ramps with minimum acceleration lanes are more dangerous than those with longer acceleration lanes.

Select a gap in the traffic that will permit the car to merge without interfering with the progress of other vehicles.

If no gap is visible, watch the ramp ahead and the main roadway. He should stop before reaching the end of the on-ramp if it appears it will be necessary to wait for a gap. This will allow room for acceleration.

Long Entrance Ramp (Acceleration Lane)

When driving on an acceleration lane that continues as an off-ramp for the main roadway traffic, the driver should watch carefully for vehicles leaving the main roadway and crossing over and merging onto the acceleration lane. In preparing to merge, the driver should:

Use the acceleration lane to match the speed of the traffic on the main roadway.

Check traffic ahead on the acceleration lane.

If it is practical, the vehicles ahead should be allowed to leave the acceleration lane before the driver attempts to merge onto the roadway.

Check traffic on the main roadway through mirrors and by glancing over both shoulders when parallel to the main roadway.

Select a gap that will permit the car to merge onto the main roadway without interfering with the progress of other vehicles.

If no gap is visible, hesitate on the beginning portion of the acceleration lane, if necessary, to await an acceptable gap.

The car should not be stopped on the acceleration lane.

Signal his intention to enter the main roadway.

If a portion of the acceleration lane also serves as a deceleration lane for an off-ramp, the signal should be made when the driver reaches the common portion of the lane.

If it is not possible to merge safely the driver should continue on the deceleration lane and exit.

Enter the main roadway, observing the lead vehicle and the gap through the side window and following vehicles through mirrors.

Minor adjustments in speed may have to be made.

Steer the car smoothly into the adjacent lane of the main roadway.

Merging With Main Roadway Traffic

When approaching and entering the main roadway, the driver should:

Adopt a speed that allows the car to reach the main roadway coincident with the gap.

Recheck the traffic on the main roadway and on the ramp.

Signal his intention to merge onto the main roadway.

The signal should be made early enough so that traffic on the main roadway can swing into the adjacent lane, if it is empty, to permit the driver to enter.

Permit the vehicle ahead to leave the ramp, if practical, before attempting to enter the main roadway.

Observe the lead vehicle and the gap through the side window and the following vehicles through the mirrors.

Drive within the borders, pavement markings, or curbings that divide the entrance ramp from the main roadway.

Guide the car into the adjacent lane of the main roadway, adjusting speed as necessary.

The student should know the skills required for entering the main roadway from an on-ramp.

Estimating Speed and Distance of Rear Approaching Vehicles

The driver must be able to determine when it is safe to enter the main roadway from an entrance ramp. This is a perceptual skill based upon the driver's estimates of the speed and distance of rear approaching vehicles on the main roadway. These estimates are utilized in making judgments on the time that is available before the first car arrives ("lag") or between two rear approaching vehicles ("gap") on the main roadway.

Coordinating Surveillance and Steering Activities

The driver must also possess skill in coordinating steering and surveillance activities. On both long and short on-ramps the driver must check traffic on the main roadway while travelling down the ramp. At the same time, he must be able to maintain the proper path on the ramp.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to enter the main roadway from an on-ramp.

Selecting Gap

A new driver generally tends to be overcautious in selecting the moment to enter main roadway traffic from an entrance ramp. The instructor should give verbal cues to the student driver to enter the roadway. He should also explain terms or concepts such as "lag," "gap," and "accelerative capability" to the driver and the relationship of each to entering the main roadway safely.

A few student drivers may not be cautious enough and may attempt to enter the roadway when it is unsafe. The instructor should cue such students to "brake" immediately. The procedures and concepts associated with entering traffic should be reviewed.

Stopping When Ramp is Short

A beginning driver tends to want to stop before entering the main roadway when the entrance is short. The instructor should remind student drivers that reducing speed excessively or stopping on an on-ramp is dangerous for two reasons: the risk of the vehicle following hitting the car from the rear; and length of time required to accelerate from a stopped position or very slow speed to the normal highway speed. The student must learn to use the lane for acceleration so that he can merge smoothly onto the main roadway.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	--	--
Chalkboard or traffic situation board for in-car use	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Freeway Driving is Different,"* 14½ minutes, color, American Automobile Association.

"Freeway Driving Tactics,"* 16 minutes, color, Charles Cahill Associates, Inc.

"Freeway Maneuver No. 1—Entering the Freeway,"* filmstrip, 23 frames, color, Ford Motor Company.

"Jet Age Driving & Behind the Scenes,"* 2 films - one reel, 17 and 20 minutes, color. Modern Talking Pictures Service, Inc.

"Multiple Lane Traffic," 16 minutes, b/w, Progressive Pictures.

Simulator Films

"Drive in Review," 27 minutes, color, Allstate Enterprises.

"Expressways are Different,"* 24 minutes, color, Allstate Enterprises.

"Expressway Excellence,"* 17 minutes, color, Aetna Life & Casualty Co.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

RESOURCE MATERIALS

The student should know the basic texts, periodicals and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System,* film section "Expressway Excellence."

Allstate Insurance Company. *Allstate Good Driver Trainer System,* film booklets as follows: "Expressways are Different," and "Drive in Review."

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 191, 195-197.

Anderson, William G. *Laboratory Manual for Learning to Drive,* p. 25.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies.*

Anderson, William G. *Teacher's Manual for Learning to Drive,* p. 49-52.

Center for Safety Education, New York University. *Driver Education and Traffic Safety,* pp. 218-219, 222.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 42-0 - 42-6.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives,* pp. 128-131.

Quane, W. Laurance, *Utilizing the Multiple Car Driving Range,* pp. 15, 18-19, 36-37, 72.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Traffic Safety Education: Content, Methods and Organization,* p. 239.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education,* p. 52.

Glenn, Harold T. *Youth at the Wheel,* p. 213.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 220-221, 233.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), p. 62.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition,* pp. 118, 140.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively,* p. 287.

Off-Ramps

The student should know the importance of the off-ramp as a characteristic of the freeway system.

Before a driver gets on the freeway, he should know his route, including the exit he must use to reach his destination. Missing the desired exit may cause delays in the driver's journey or force him to take risks or make illegal turns to correct the error. Off-ramps are designed for the safety of drivers wishing to leave the main roadway and for the continuance of the flow of traffic on the main roadway without interruption. They are less difficult to negotiate than an on-ramp, but are more hazardous because drivers exit a limited access highway at a higher rate of speed than they enter it.

DRIVING TASK REQUIREMENTS

The student should know the procedures and hazards that pertain to the use of off-ramps for leaving the main roadway.

Preparing to Leave Main Roadway

The design of freeway exits is often complex. The directions of the exits may vary markedly from what the driver may expect. In preparing to leave the main roadway on an off-ramp, the driver should

Watch for signs indicating the distance to and location of the desired exit.

Move well in advance into the lane that leads to the exit.

Watch for a deceleration lane.

Approaching and Entering Off-Ramp

When approaching and entering the off-ramp, the driver should:

Signal his intention to turn onto the off-ramp.

Look for posted signs indicating off-ramp speed limits.

Guide the car smoothly onto the off-ramp.

When a deceleration lane is not provided, the driver should:

Slow down on the roadway, but no more than necessary to reach a safe speed for entering the off-ramp.

> Slowing down on the main roadway is a major cause of all freeway exit accidents. It is particularly critical in the case of left-hand exits owing to faster speeds in the left lane and the failure of drivers to expect deceleration in that lane.

Check for roadway entrances near the off-ramp, watching for vehicles merging into and diverging out of the roadway and adjusting speed to accommodate the entering traffic.

When a deceleration lane is provided, the driver should:

Move into this lane as soon as it is safe to do so.

Moving into the deceleration lane as soon as possible after the onset of this lane reduces the need to decelerate on the main roadway and precludes the necessity for cutting in front of the vehicle already present in the deceleration lane.

Begin deceleration after moving into the deceleration lane.

Slowing down on the main roadway is a major cause of all freeway exit accidents. It is particularly critical in the case of left-hand exits, owing to faster speeds in the left lane and the failure of drivers to expect deceleration in that lane.

Glance at speedometer to ensure appropriate deceleration prior to entering the off-ramp.

While off-ramps with large turning radii and long deceleration lengths are the safest, those with medium turning radii are the most dangerous, due possibly to the failure of the driver to perceive the danger as greatly as in an off-ramp with a short radius curve.

When the deceleration lane is also a part of the acceleration lane for vehicles entering the roadway, watch for vehicles entering the lane and adjust speed to accommodate entering traffic.

Driving on Off-Ramp

When driving on the off-ramp, the driver should:

Observe speed limit signs.

Observe the general configuration of the interchange.

Drive in the center of the off-ramp lane, staying clear of any barriers.

Nearly three-fourths of all ramp fixed-object accidents occur on off or exit ramps.

Observe signs on cross roadways that give information on alternate destinations.

The design of freeway exits is often sufficiently complex that the points and directions of exits vary markedly from expectation. Avoiding an incorrect exit or use of an entrance requires close attention to signs.

Make sure he slows down to a safe speed.

Watch for traffic, as he nears the end of the off-ramp, that may be stopped or waiting in line at the end of the ramp.

Slow down and prepare to stop when nearing the end of the off-ramp.

The student should know the skills required for using an off-ramp to leave the main roadway.

Estimating Ramp Speed

The driver must be able to judge from the length and curvature of the ramp the maximum speed at which he may safely enter the off-ramp without obstructing following traffic. When he has entered the off-ramp, he must be able to judge from the rate of curvature how much more he must slow down before entering the curve. It may be necessary to slow down very abruptly if the ramp is short and if it curves sharply.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to use an off-ramp to leave the main roadway.

Speed Adjustment

Beginning drivers may experience some difficulty in determining when to adjust car speed when leaving the main roadway. Some students may slow down on the main roadway long before it is necessary and, consequently, impede traffic flow. Others may not slow down soon enough on the roadway or on the off-ramp creating a hazard to themselves and others in the vicinity. In either case the instructor should give the student driver a verbal cue and review the procedures for leaving the roadway on an off-ramp with and without a deceleration lane.

Estimating Ramp Speed

In addition to determining when to reduce speed, beginning drivers may have difficulty in estimating the maximum speed at which he may enter the ramp safely without obstructing traffic to the rear. Many off-ramps have posted exit speeds. The task of estimating the maximum speed in such cases is eliminated. At other times heavy traffic ahead on the ramp will cue the driver to slow down.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	--	
Chalkboard or traffic situation board for in-car use	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

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"Freeway Driving Tactics,"* 16 minutes, b/w, Charles Cahill Associates, Inc.

"Freeway Maneuver No. 4, Leaving the Freeway,"* filmstrip, 21 frames, color, Ford Motor Company.

"Jet Age Driving and Behind the Scenes,"* 2 films - one reel, 17 and 20 minutes, color, Modern Talking Pictures Service, Inc.

"Multiple Lane Traffic,"* 16 minutes, Progressive Pictures.

*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Simulator Films

"Drive in Review," 27 minutes, color, Allstate Enterprises.

"Expressways are Different,"* 24 minutes, color, Allstate Enterprises.

"Expressway Excellence,"* 17 minutes, color, AEtna Life & Casualty Co.

RESOURCE MATERIALS

The student should know the basic texts, periodicals and reports that will provide material for the development of lesson plans.

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Allstate Insurance Company. *Allstate Good Driver Trainer System,* film booklets as follows: "Expressways are Different" and "Drive in Review."

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 191, 206.

Anderson, William G. *Laboratory Manual for Learning to Drive,* p. 25.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies,* pp. 197-199.

Anderson, William G. *Teacher's Manual for Learning to Drive,* pp. 49-52.

Center for Safety Education, New York University. *Driver Education and Traffic Safety,* p. 222.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 42-6 - 42-10.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives,* pp. 132-134.

Quane, W. Laurance, *Utilizing the Multiple Car Driving Range,* pp. 15, 18-19, 36-37, 72.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization,* p. 239.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education,* p. 52.

Glenn, Harold T. *Youth at the Wheel,* pp. 218-219.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 230-232, 236.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), p. 63.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition,* pp. 140, 148.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively,* p. 288.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Hills

The student should be able to downshift, brake, and accelerate correctly to maintain sufficient speed control when negotiating hills.

The limitations to visibility on a hill, the possibility of stalling behind slow-moving vehicles, and the danger of brakes fading or burning out on a steep downgrade, make hills a dangerous factor in the driving environment. The driver must learn how to control his speed on upgrades and downgrades by proper use of the accelerator and brake pedals and the gearshift lever.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws that pertain to negotiating hills safely.

Approaching Upgrades

When approaching an upgrade, the driver should:

Check following traffic for trucks or heavy vehicles approaching the upgrade at excessive speed.

Accelerate slightly if the car is underpowered in relation to the grade.

Select the appropriate lane—the far right lane or auxiliary climbing lane, if there is one, if the car is underpowered or will be operating at a low speed.

Negotiating Upgrades

In negotiation an upgrade, the driver should:

Maintain a constant speed by applying sufficient pressure to the accelerator pedal.

Shift to a lower gear (downshift) or move the selector lever from drive to low if slow-moving vehicles are observed ahead on a long or steep upgrade.

Trucks generally must downshift near the crest of hills or long grades, which reduces their speed markedly.

Shifting to a lower gear increases the pulling power of the engine, thereby preventing the car from vibrating and/or stalling.

Watch for signs that the car is overheating, especially on long, steep upgrades.

Downshifting causes the fan to turn at a higher speed, drawing in more air through the radiator.

Downshifting and/or turning on the heater may alleviate this problem. Turning on the heater helps dissipate the heat in the radiator by cycling the radiator coolant through the car's heater unit.

Approaching Crests

When approaching a crest, the driver should

Decelerate slightly to compensate for limited sight distance and for an anticipated increase in speed upon cresting.

Failure to reduce speed to compensate for limited sight distance upon cresting a hill is a significant factor in many accidents.

When approaching a crest on a narrow roadway, the driver should

Keep far to the right.

Sound the horn to alert oncoming vehicles.

Approaching Downgrades

When approaching a downgrade, the driver should

Look for signs indicating the length and/or grade of the downgrade.

Test the brakes, if the grade is long and/or steep.

In case of brake failure, preparation can be made for slowing down or leaving the roadway before starting down the grade.

Shift into lower gear before starting down a long, steep downgrade.

The additional braking power provided by the engine in low gear reduces wear on the brakes. Riding the brakes builds up intense heat which is damaging to both brakes and tires.

Decelerate prior to starting down a steep downgrade.

If too much velocity is attained, it may be impossible to decelerate on the downgrade.

Negotiating Downgrades

When negotiating a downgrade, the driver should

Check the rearview mirror periodically to determine whether vehicles behind may be accelerating excessively.

Maintain a constant speed by reducing accelerator pressure, applying the brakes partially, throughout the descent, if necessary, or shifting into a lower gear.

To control speed the car must be kept in gear and not permitted to coast.

Yield the right-of-way when meeting a vehicle if the downgrade is narrow, by backing into a safe turnout, if necessary, and allowing the vehicle to continue. It is easier to control a car when backing up than when backing down.

Approaching Bottom of Downgrade

When approaching the bottom of a downgrade, the driver should

Shift back into normal driving range.

Resume normal driving speed.

The student should know the skills required for negotiating hills safely.

Determining When to Downshift

The driver must be able to judge, from the car's responsiveness and from the engine's sound and vibration, when to downshift when climbing a hill. If the car appears to lose accelerative power while climbing a hill, or if it vibrates or indicates it may stall, the driver should downshift.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to negotiate hills.

Determining When to Downshift

A beginning driver in a manual shift car may have difficulty in determining when to downshift (shift to a lower gear) on hills. He should be aware of the fact that downshifting increases the pulling power of the engine on an upgrade and provides the braking power of the engine on a downgrade.

When the car is negotiating a long, steep upgrade or when it is behind slow-moving vehicles, it may vibrate or appear about to stall. Downshifting will give the engine more power and prevent stalling and vibration. The student must learn to time the downshift before the engine does stall.

Downshifting for descending a hill eliminates the need to apply constant brake pressure which could cause the brakes to burn out. The instructor should make sure the student learns to downshift for a downgrade before starting down the hill.

Observing Rear Approaching Traffic

The beginning driver may tend to concentrate on speed control and devote too little attention to traffic approaching from the rear. When negotiating downgrades and approaching upgrades he should periodically check the rear view mirror to see if vehicles behind him are accelerating excessively. Students neglecting surveillance activities should be reminded of their errors.

Other Common Problems

Failure to maintain constant speed when negotiating grades.

Failure to reduce speed sufficiently on approach to the crest to compensate for limited sight distance and for an anticipated increase in speed.

Improper lane selection and/or position when negotiating grades.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	--	--
Chalkboard or traffic situation board for in-car use	--	--

FILMS/FILMSTRIPS/SLIDES

Simulator Films

"Safe Highway Driving,"* 16 minutes, color, AEtna Life & Casualty Co.

"Shift for Yourself,"* 26 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty Co in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System,* film section "Highway Driving."

Allstate Insurance Company. *Allstate Good Driver Trainer System,* film booklets as follows: "Hit the Highways," and "Shift for Yourself."

American Automobile Association. *Practice Driving Guide for Use with Sportsmanlike Driving,* pp. 21-22, 36.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 166-168, 230, 397-400.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies,* pp. 173-177.

Anderson, William G. *Teacher's Manual for Learning to Drive,* pp. 49-52.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 43-0 - 43-3.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives,* pp. 136-138.

SUPPLEMENTARY REFERENCES

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education,* pp. 232-236, 260-262.

Center for Safety Education, New York University. *Man and the Motor Car,* pp. 195-196.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 125, 190-191.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), p. 61.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition,* pp. 136-137, 165-166.

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Curves

The student should be able to negotiate a curve safely and comfortably.

There are four factors a driver should consider when negotiating a curve: speed of the car, sharpness of the curve, side slope of the roadway, and road and tire conditions. Taking a curve too fast not only produces some physical discomfort to the driver because of the lateral acceleration; the excessive speed also may swing the car into an oncoming lane or cause the car to leave the roadway entirely.

DRIVING TASK REQUIREMENTS

The student should know the procedures and hazards that pertain to the safe, comfortable negotiation of highway curves.

Watching for Approaching Curves

A significant number of accidents occur each year because drivers are not aware of an approaching curve until it is too late to react appropriately. At all times the driver should watch the road ahead for indications of a curve and observe the roadside for signs warning of approaching curves.

Approaching a Curve

In approaching a curve, the driver should:

Adhere to the posted speed.

> Excessive speed while entering a curve is a significant factor in many accidents.
>
> Posted speed limits for curves are generally close to the maximum safe and comfortable speed. The posted speed is usually lower than the normal speed limit because of reduced sight distance and the effects of inertia.

If the limit is not posted, estimate a safe speed from the degree of curvature and banking.

> Adapting speed to unposted curves requires the driver to judge what the safe speed will be by looking at the curve's bank and sharpness and making a mental comparison of these two factors with those of other curves he has negotiated. When he is into the curve and "feels" his body being "tugged" or he "feels" he is being pulled from the seat, he should recognize that his speed is too great and should adjust the speed immediately.

Verify the speed by checking the speedometer.

> Continued high speeds make it difficult to estimate reduced speed accurately.

It is important that any deceleration be completed before entering the curve, for the following reasons

(1) If the car enters a curve at high speed, the rear end will tend to swing out and the front end will cease to respond to steering, (2) acceleration, together with braking hard enough to lock the wheels, will cause the car to run off the road in a straight line; (3) hard braking increases the chance of a skid.

Driving Through a Curve

In driving through a curve, the driver should:

Look well ahead of the turning path.

Looking ahead enhances the smoothness of the turn on the curve.

The driver's fixation point remains between the center line and the right shoulder, regardless of the curve's direction.

Maintain the correct position in the lane.

Unless the driver continuously steers to maintain lane position, centrifugal force will pull the car to the outside of the curve.

Failure to maintain the proper lane while negotiating a curve is a factor in a significant number of accidents.

Maintain velocity through the curve by keeping pressure on the accelerator.

Maintaining velocity or slight acceleration through a curve reduces the chances of skidding.

Adjust his speed to the curvature as necessary.

If the rate of curvature is greater than the driver anticipated, speed should be reduced by releasing the accelerator and applying the brakes lightly, if necessary.

The best and safest procedure is to refrain from using the accelerator and brake and concentrate on steering to keep all the wheels on the paved surface.

The lateral force which develops in a curve is the primary criterion for the choice of speed.

Reduce speed, when visibility is obscured by vegetation or darkness, to keep braking distance within sight distance.

The accident rate where sight distance is short is over twice that where sight distance is not limited.

Leaving Curve

When leaving the curve and approaching the straightaway, the driver should

Permit the car to drift toward the outside of the roadway to relieve stress on the car.

Accelerate to the original or posted speed.

The student should know the skills required for negotiating highway curves.

Determining Speed

The driver must be able to judge what a safe speed on unposted curves will be. He must be able to associate his visual perception of the curvature and banking of the curve with the visual and kinesthetic cues of speed. Upon entering a curve at excessive speed, the driver experiences cues of lateral acceleration caused by centrifugal force. With experience he learns the maximum speed at which he can enter a curve without experiencing an excessive lateral acceleration.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to negotiate curves.

Looking Through the Curve

Drivers having difficulty with speed control when driving on curved roadways may not be "looking through the curve." Beginning drivers may be fixating on the road immediately to the front of the car, which makes it difficult to maintain direction on the intended path. In attempting to overcome the resulting directional problem the driver may reduce speed, and it may be unnecessary in many cases. The instructor should explain to student drivers prior to behind-the-wheel instruction the interrelationships between focusing on the farthest clear path of travel, directional control, and speed adjustments.

Visual and Kinesthetic Cues

In order to develop the ability to associate visual perception of curvature with cues of proper speed, the beginning drivers should experience the kinesthetic cues of excessive speed. This requires the instructor to allow or encourage the student to enter curves at speeds that, while not hazardous, are sufficiently great to create lateral acceleration above the "normal" level. Practice of this nature should be conducted on a driving facility if possible, or a roadway where traffic flow is light.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	--	--
Chalkboard or traffic situation board for in-car use	--	--

FILMS/FILMSTRIPS/SLIDES

Simulator Films

"Hit the Highways,"* 23 minutes, color, Allstate Enterprises.

"Safe Highway Driving,"* 16 minutes, color, AEtna Life & Casualty Co.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System,* film section "Highway Driving."

Allstate Insurance Company. *Allstate Good Driver Trainer System,* film booklet "Hit the Highways."

American Automobile Association. *Practice Driving Guide for Use with Sportsmanlike Driving,* p. 24.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 84-87, 156-157.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies,* pp. 173-177.

Anderson, William G. *Teacher's Manual for Learning to Drive,* pp. 49-52.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 44-0 - 44-1.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives,* pp. 140-141.

SUPPLEMENTARY REFERENCES

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education,* pp. 31-32.

Glenn, Harold T. *Youth at the Wheel,* pp. 242-247.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 189, 192, 246.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), p. 60.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition,* pp 16, 20, 135-136, 157-158, 165.

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Lane Usage

The student should know the importance of selecting the appropriate lane for driving.

There is always a lane that represents the safest possible lane for a particular roadway and traffic condition. On a four-lane roadway it is generally the right-hand lane; on a six-lane roadway it may be the center of the three lanes. The driver must be able to select the lane that will provide him and other drivers the safest, most expeditious travel.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws for selecting the appropriate lane for driving.

General Lane Usage Procedures

Some states place restrictions on the usage of lanes for through movement on roadways with six or more lanes or at least three lanes one way. On such roadways the left and right lanes may be frequently stopped for vehicles turning onto the access roads. In general, when selecting the appropriate lane for driving, the driver should:

Drive in the far right lane, using the left lane(s) to pass.

Driving in a passing lane is a contributing cause in a large percentage of accidents occurring on multilane roadways.

Position the car in the center of the lane.

Driving left of center is a cause in a significant number of fatal accidents attributed to improper driving.

Attempt to stay in one lane as much as possible.

Multilane Roadways

When driving on a four-lane roadway (or two lanes one way), the driver may:

Elect to pass in the right lane if traffic in the left lane is stabilized.

When driving on a six-lane (or more) roadway (or at least three lanes one way), the driver should:

Use the left lane to pass.

Use the center lane for through movement.

> The center lane or right lane may be used for passing if traffic in the left lane is blocked or slowed considerably.

When driving on a six-lane (or more) roadway (or at least three lanes one way), the driver should:

> Use the right lane when driving slowly, or when preparing to leave the roadway, unless the exit is located on the left side of the roadway.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	--	--
State Driver's Manual for identifying regulations	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Stay Right, Stay Safe," No. 3, Defensive Driving Film Series, 10 minutes, National Safety Council.

Simulator Films

"Blending in Traffic,"* 20 minutes, color, AEtna Life & Casualty Co.

"Special Driving Techniques,"* 16 minutes, color, AEtna Life & Casualty Co.

"Traffic Strategy,"* 16 minutes, color, AEtna Life & Casualty Co.

"Complex Traffic,"* 24 minutes, Allstate Enterprises.

"Intermediate Traffic,"* 22 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System,* film sections as follows: "Blending in Traffic," "Traffic Strategy," and "Special Driving Techniques."

Allstate Insurance Company. *Allstate Good Driver Trainer System,* film booklets as follows: "Intermediate Traffic" and "Complex Traffic."

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 181-183.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies,* pp. 86-87, 91, 180-181.

Center for Safety Education, New York University. *Driver Education and Traffic Safety,* pp. 220-222.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

BASIC REFERENCES (Continued)

McKnight, A. James, and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 45-0 - 45-1.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives,* pp. 142-143.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers,* p. 54.

SUPPLEMENTARY REFERENCES

Center for Safety Education, New York University. *Man and the Motor Car,* p. 279.

Glenn, Harold T. *Youth at the Wheel,* pp. 180-183.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 132, 175.

North American Professional Driver Education Association. *The New Driver's Guide,* (Strasser/Aaron), pp. 30-31.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively,* p. 270.

Off-Street Areas

The student should exercise proper surveillance and speed control in order to drive safely in and around off-street areas.

Off-street areas, including driveways, alleys, and parking lots, lack any organization in traffic flow. Because of the random movement of vehicle and pedestrian traffic, and the additional hazard of limited visibility, speed control and surveillance are of primary importance.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws that pertain to driving in off-street areas.

Approaching Entrances to Off-Street Areas

In approaching entrances to off-street areas, which include driveways, alleys, and parking lots, the driver should look ahead to determine the location of the entrance.

If approaching from the right he should

Signal for a right turn in advance of the entrance.

Pull to the right edge of the roadway.

If approaching from the left he should

Signal for a left turn.

Position the car in the lane just to the right of the center line, or if permitted, in the center lane on a three-lane road.

Yield to oncoming traffic.

Failure to yield to oncoming traffic before turning left into an off-street area is a contributing factor in a significant number of accidents.

May cross double yellow lines or undivided four-lane road when turning.

If intending to turn into an entrance immediately beyond an intersection, he should

Initiate the signal to turn when the car is halfway through the intersection, not in advance of the intersection.

Signaling prior to the intersection may confuse following drivers who may interpret the signal as an indication of intention to turn at the intersection.

If intending to back into a driveway, the driver should:

Signal for a right turn in advance of the driveway.

Pull to the right edge of the roadway and slow down.

Proceed past the driveway until the back end of the car is in line with the near edge of the driveway.

Check for pedestrians and objects in the driveway, removing the objects if necessary.

Shift to reverse and back into driveway after observing that the roadway to the rear is free of traffic.

In approaching entrances to off-street areas, the driver should:

Drive slowly enough to enter safely without having to stop.

Stopping unnecessarily or reducing speed inordinately impedes traffic and increases the chances of a rear-end collision with the following vehicles not expecting a speed reduction.

Watch for other traffic entering or exiting the off-street area.

Look for specific entrance and exit designations indicating the direction of travel.

Adjust the position of the car to provide adequate clearance for entry.

Entering Off-Street Areas

In entering the driveway, alley or parking lot, the driver should:

Continue to check for pedestrians, objects, and other vehicles in the path.

Turn into the entrance when it is clear, maintaining a safe entrance speed until he is off the main roadway before stopping inside the entrance.

A safe speed is from 5-15 miles per hour. Speeds above this range prevent the driver from reacting properly to unseen hazards. Speeds below this range may impede following traffic and cause rear-end collisions.

Stopping immediately upon entering may impede following traffic and result in obstructing the flow of traffic on the main roadway.

If entering a commercial parking lot, the driver should determine from the attendants when to pay the fee and where to park the car.

Driving in Off-Street Areas

When driving in off-street areas, the driver should:

Maintain a speed of not more than 20 miles per hour in areas where parked vehicles and vehicular and pedestrian traffic are present.

Slower speeds are required because there is no organization to the traffic flow. The random movement of vehicles and pedestrians, together with limited visibility due to parked vehicles, requires additional caution.

Watch for vehicle and pedestrian traffic, including children, and for objects in the path of the car.

Give as much space as possible to other vehicles wishing to pass in areas where clearance is reduced.

Where there is inadequate space for both the car and the other vehicle, the driver should be prepared to back up or pull into an available area to permit the other vehicle to pass.

If driving in an alley, watch for traffic entering the alley from adjoining driveways.

If driving in a parking lot, drive only in travel aisles, following the directions indicated by aisle markings or signs.

In a significant number of parking lot accidents, a contributing cause is driver failure to observe traffic aisles or traffic entering or crossing aisles from any direction.

Exiting Off-Street Areas

In leaving an off-street area, the driver should:

Locate and use designated exits.

Leave facing traffic if possible, signaling intention to turn.

If there is no traffic signal, the driver should stop the car completely before entering the roadway.

Yield to traffic on the main roadway.

Failure to yield to all cross traffic before exiting an off-street area and entering the roadway is a contributing factor in a significant number of accidents.

If backing to the right onto the roadway from a driveway, the driver should:

Observe that the roadway is clear of traffic approaching from the right.

Back into the near lane close to the curb.

Accelerate slowly while positioning the car in the center of the lane.

If backing to the left onto the roadway from a driveway, the driver should:

Limit this maneuver to two-lane roadways.

Check traffic in both directions.

Accomplish the maneuver quickly but cautiously.

The student should know the skills required for driving in and around off-street areas.

The driver must be able to accurately judge whether adequate lateral clearance exists before proceeding down a parking aisle where other vehicles are approaching from the opposite direction. This same ability must be exercised when driving in narrow alleys or when entering or leaving garages. Estimating lateral distance is largely dependent upon the driver's appreciation of the size of the vehicle he is driving. The ability to estimate lateral distance also becomes more difficult as speed increases.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	--	--
Chalkboard or traffic situation board for in-car use	--	--

FILMS/FILMSTRIPS/SLIDES

Simulator Films

"Intermediate Traffic,"* 22 minutes, color. Allstete Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

Allstate Insurance Company. *Allstate Good Driver Trainer System,* film booklet "Intermediate Traffic."

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 176-177.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff Richard A. *Let's Drive Right,* pp. 169, 178, 290.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 48-0 - 48-6.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives,* pp. 170-176.

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Railroad Crossings

The driver should take extra precautions when approaching railroad tracks.

While there are many circumstances that may contribute to a car-train accident, many can be related to driver carelessness. The train, by virtue of its weight, size, speed, and inflexible route, has the right of way. It cannot stop or steer as a car can. Thus, it is up to the driver to operate his car in such a manner as to avoid this type of accident.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws that pertain to driving across railroad tracks.

General

State laws generally require school buses, tank trucks carrying explosives or flammable liquids, and commercial carriers to stop for railroad crossings except under certain specified conditions. The driver should anticipate stopping when following such vehicles and approaching a railroad crossing. The driver also should:

- Look for signs along the roadway and other indications that a railroad crossing is ahead.
  - Railroad crossing accidents annually kill more than 1500 people and injure 5,000.
  - In about a third of the grade crossing accidents the car strikes the train.
  - About four out of ten crossing accidents occur where there are flashing lights and automatic gates.
  - Sixty percent of the crossing accidents occur during daylight and involve local drivers or motorists living a mile or two from the crossing.
- Slow down and prepare to stop unless there is a clear view of the tracks.

Approaching and Stopping

Eighty percent of the country's railroad grade crossings do not have protection devices to warn drivers of an approaching train. They have only signs to mark the grade's location. When approaching a railroad crossing with no signal, the driver should:

- Look quickly in both directions, and open the window and turn down the radio to enhance the ability to hear the train's warning bell or whistle.
- If no train is in sight and visibility is clear, maintain speed and cross immediately.
- If a train is approaching, stop the car within 50 feet (but not less than 15 feet) from the nearest rail.

When stopped at a multitrack, no signal crossing, the driver should

Cross the tracks if no trains are approaching

If waiting for an approaching train, remain stopped until the first train has completely cleared the crossing and the view is clear in both directions on the other tracks

The first train may screen another train coming from the opposite direction, and its sounds may drown out the noise of the approaching train.

Remain stopped if other trains are approaching

When approaching a signalized railroad crossing and the signal is activated, the driver should

Stop completely and remain stopped until the signal indicates the track is clear.

Proceed across the tracks after obtaining a clear view of the tracks in both directions.

Proceed across the tracks, even though the signal is activated, if there are no trains approaching from any direction or if a single train is approaching at a very slow speed and at some distance.

Proceed across signalized tracks if told to do so by a flagman

When approaching a signalized railroad crossing and the signal is not activated, the driver should

Listen for the sound of a train and look in both directions before crossing the tracks.

Railroad crossing signals should not be trusted entirely because they can malfunction

Proceed without stopping if no train is coming, if it is stopped at a distance, or if it is moving slowly at some distance.

Crossing Tracks

When crossing railroad tracks, the driver should

Refrain from stopping on the tracks or between tracks. Refrain from crossing the tracks until there is sufficient space on the other side of the tracks for the car to completely clear the tracks.

Take precautions against stalling by using a low enough gear in manual shift cars and by applying steady pressure on the accelerator pedal.

Cross as quickly as possible if the flashing signal or automatic gate is activated while in the process of crossing.

Engine Failure on Railroad Tracks

If the driver stalls the engine of the car while crossing railroad tracks, a dangerous situation may develop. To minimize this possibility, the driver should make sure that the car engine is thoroughly warmed up before starting across the tracks, and while crossing should apply smooth, even pressure to the accelerator pedal. He should avoid shifting gears while crossing, since this increases the danger of stalling.

If the car stalls on the tracks the driver should

Attempt to move the car by using the starter or by manually pushing the car if time permits.

Instruct the passengers to leave the car and clear the area.

> Occupants should move as quickly as possible in the direction the train is coming from. Debris from a collision will be pushed in the direction the train is moving.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLA
CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--
Handout/pamphlet	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Safety at the Crossroads," 18 minutes, color, Illinois Central Railroad Company.

"Safety Facts About Crossing Tracks," 13 minutes, color, Southern Pacific Company.

Simulator Films

"Intermediate Traffic,"* 22 minutes, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

Allstate Insurance Company. *Allstate Good Driver Trainer System,* film booklets as follows: "Moderate Traffic" and "Intermediate Traffic."

American Automobile Association. *Practice Driving Guide for Use With Sportsmanlike Driving,* p. 24.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 169-170.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 49-0 - 49-4.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives,* pp. 178-181.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

SUPPLEMENTARY REFERENCES

Automotive Safety Foundation. ***A Resource Curriculum in Driver and Traffic Safety Education***, p. 57.

Center for Safety Education, New York University. ***Man and the Motor Car***, pp. 269-270.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. ***Let's Drive Right***, pp. 66-67, 196, 263.

North American Professional Driver Education Association. ***The New Driver's Guide*** (Strasser/Aaron), p. 61.

Pawlowski, Joseph G. and Johnson, Duane R. ***Tomorrow's Drivers: Teacher's Edition***, p. 137.

Richards, Hay A., Rowan, Neilon, J., and Kanak, Ernest W. "Diagnosing Highway-Rail Accidents," ***Traffic Safety***, vol. 70, no. 6, pp. 12-14, 40, National Safety Council Publication, June 1970.

Bridges and Tunnels

The student should know how to negotiate bridges and tunnels safely and expeditiously.

Bridges and tunnels shorten distances for travelers and expedite traffic over and through areas where a conventional roadway is impossible or impractical. Their utility, however, depends on the manner in which a driver negotiates them. When an accident occurs on a bridge or in a tunnel, a hazardous situation develops immediately because of the interruption to the flow of traffic which, in addition to threatening multi-car involvement, may cause a delay in the arrival of necessary emergency equipment.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and law that pertain to the use of bridges and tunnels.

Approaching Bridges and Tunnels

In approaching bridges and tunnels, the driver should:

Watch for posted signs providing information concerning the number of lanes available, lane restrictions, speed limit, and the use or non-use of lights in the tunnel.

If they are narrow, decelerate and keep to the right.

Negotiating the structure at reduced speed gives the driver better control.

Keeping to the right provides clearance with traffic in the adjacent lane.

After Entering Bridge or Tunnel

After entering the bridge or tunnel, the driver should:

Watch for other traffic and lane side structures.

Keep moving except in response to traffic flow or an emergency.

Stopping, standing, or parking is prohibited on bridges or other elevated structures on the highway and in tunnels and viaducts.

Adhere to regulations, including those for proper speed.

The speedometer should be checked frequently in tunnels to assure that speed is adjusted to the grade. Drivers may be unaware in a tunnel that they have lost speed on an upgrade.

Exiting a Bridge or Tunnel

In leaving a bridge or tunnel, the driver should:

Check posted signs for exit information and speed limit ahead.

Turn off lights, if necessary.

The student should know the skills required for negotiating bridges and tunnels.

Mastery of Speed and Steering Controls

The driver must be able to maintain directional control without impeding traffic while crossing a bridge or driving through a tunnel. Frequently, bridges may be narrower than the roadway and tunnels may appear to be narrower because of the lighting and wall structure. Driving across a bridge or through a tunnel requires greater mastery of steering and other basic controls.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to negotiate bridges and tunnels.

Speed and Directional Control

Because bridges may be narrower than the roadway and because tunnels may appear to be narrower because of the lighting and wall structure, beginning drivers can be expected to have some difficulty driving across bridges or through tunnels. Generally, these problems can be attributed to a less than adequate performance level of some of the basic control skills.

New drivers may drive more slowly than experienced drivers on bridges and through tunnels and may become tense in an effort to remain to the right to provide adequate clearance for traffic in the adjacent lane. With more driving experience, speed and directional control skills should develop so that the student can easily drive in confined areas without getting that "closed in" feeling and without unnecessarily impeding traffic.

Other Common Problems

Failure to remove sun glasses when entering a tunnel.

Staring at the sides of the tunnel or bridge rather than focusing well ahead.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	–	–

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide materials for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System*, film section, "Crash Avoidance."

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, p. 223.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 124, 164, 193, 196, 236.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 49-4 - 49-5.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 182-183.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, p. 138.

Toll Plazas

The student should have the ability to negotiate toll plazas safely and expeditiously.

At toll plazas, where the fee is paid for the use of a toll road, turnpike, or expressway, drivers are involved in many different actions: scanning other traffic, checking for posted regulations, checking for a suitable lane and toll booth, getting the money ready for the fee. Some of these actions distract drivers from their normal driving procedures. Thus, not only should the drivers have good driving skills, they should exhibit good driver attitudes and behaviors in order to minimize the chance of an accident.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws that pertain to negotiating toll plazas.

Approaching Toll Plaza

When approaching a toll plaza the driver should:

Check the speed limit and adjust his speed accordingly.

Maneuver into the correct lane.

Get the fee and the toll card ready.

If there is a passenger, he should be asked to help so that the driver can attend to his driving.

Observe traffic to be alert to drivers who may be distracted while they fumble for money.

More than a tenth of all turnpike accidents occur at toll plazas.

Crowded lanes approaching the plaza should be avoided, but the driver should also avoid crossing more than one lane.

Observe the toll booths to determine those that are open and those that are "exact change" booths.

Correct change lanes are generally faster since they are used by drivers with the exact change and who do not need an attendant for directions.

At Toll Booth

At the toll booth, the driver should:

Come gently to a full stop parallel to the booth.

Give the fee and the toll card to the attendant.

Ask the attendant for information and road conditions, if needed.

If using an exact change booth, toss the coins into the basket and wait for the green signal or the gate to lift before proceeding.

If the change misses the basket, the driver should remain in the car and summon an attendant or pay the fee again.

Drivers may feel that it is more convenient to pay the fee again rather than summon an attendant and cause a delay to himself and traffic behind him. The automatic change machines will accept more than the required toll provided the denominations are correct.

Leaving the car at a toll booth is hazardous and in many states illegal.

Leaving Toll Plaza

When leaving the toll plaza the driver should:

Accelerate smoothly.

Check signs for directions and speed limit.

Merge smoothly into proper lane.

Watch for other drivers who may accelerate rapidly or cut in front.

Pull into temporary parking area if he needs to study the map or plan stops.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	–	–

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivetrainer System*, film section "Decision is Yours."

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 213, 219.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 49-4 - 49-8.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 184-186.

III-B-3

Adverse Driving Conditions

Road Surfaces
Wet Surfaces
Sand-Covered Roadways
Road Shoulders
Obstructions and Barricades
Snow and Ice
Weather Conditions and Limited Visibility

Road Surfaces

The student should be able to drive safely on different types of road surfaces and road surface irregularities.

Gravel, dirt or brick road surfaces, and roads scattered with mud, loose gravel, sand, or oil reduce surface friction and make driving hazardous. Additional hazards are produced when, due to poor maintenance, weather, or heavy traffic, a washboard condition, potholes, dips, and bumps appear unexpectedly in the surface of the road.

DRIVING TASK REQUIREMENTS

The student should know the procedures and hazards related to driving on different types of road surfaces and road surface irregularities.

If the surface of the road is dirt, gravel, wood, or brick, the driver should:

Drive more slowly than he would on a dry, paved roadway.

Loose or slick surfaces reduce traction and may produce a skid.

Driving too fast on poorly surfaced roadways is a contributing [illegible] in a significant number of accidents each year.

Avoid sharp turning movements.

Increase following distance.

Watch for hazardous conditions in the roadway, such as loose dirt or gravel, cracks, holes, or nails in a wooden surface, holes, loose brick, slippery spots, and the like on a brick surface.

If the roadway has bumps, washboard conditions, potholes, cracks or ruts the driver should in general:

Reduce speed to accommodate irregularities and to anticipate additional deterioration in the roadway ahead.

Observe and respond to posted signs of poor road conditions.

Observe the size/depth of the irregularity.

Attempt to steer around or straddle a pothole or rut.

If steering around or straddling a pothole or rut requires adjusting the position of the car in the lane, roadway traffic should be checked to ensure that lateral movement of the car will not interfere with other traffic.

If a complete lane change is involved, the turn signal should be activated.

When the pothole cannot be avoided

Apply the foot brake to reduce speed before reaching the pothole

Release the foot brake while the wheel goes through the pothole.

Hard application of the foot brake locks the wheels and transfers road shock to the car, releasing the foot brake allows the wheel in the pothole to absorb much of the shock.

Grasp the steering wheel firmly and make corrective steering movements to maintain a straightforward heading of the car

If the rut is deep and cannot be avoided.

Drive slowly.

Grasp the steering wheel firmly.

Turn wheels at a sharp angle to exit the rut

Wheels turned only slightly provide insufficient lateral force to overcome the force exerted by the edge of the rut

The student should know the skills required for driving on different types of road surfaces.

To get the car out of a pothole the driver must be able to judge how far to turn the wheel without swerving excessively. He must be able to countersteer quickly to avoid leaving the roadway or striking something.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in driving on various road surfaces and roadway irregularities.

Steering Procedures

In order to climb out of a rut without swerving excessively, the driver should turn the wheel at a sharp angle so that there is sufficient lateral force to overcome the resistance of the edge of the rut. The inexperienced driver generally has difficulty judging the amount to turn the wheel. Verbal cues by the instructor and continued practice should enable the student to develop the ability to properly estimate the amount to turn the wheel to exit the rut.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	–	–

FILMS/FILMSTRIPS/SLIDES

Simulator Films

"Driving Emergencies,"* 16 minutes, color, AEtna Life & Casualty Co.

"Hit the Highways,"* 23 minutes, color, Allstate Enterprises

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide materials for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. ***Teacher's Manual: AEtna Drivotrainer System,*** film section "Driving Emergencies."

Allstate Insurance Company. ***Allstate Good Driver Trainer System,*** film booklet "Hit the Highways."

American Automobile Association. ***Teacher's Handbook for Sportsmanlike Driving,*** pp. 83, 212-213.

Center for Safety Education, New York University. ***Driver Education and Traffic Safety,*** pp. 205-206, 253-257.

McKnight, A. James and Adams, Bert B. ***Driver Education Task Analysis Volume I. Task Descriptions,*** pp. 46-0 - 46-3.

McKnight, A. James and Hundt, Alan G. ***Driver Education Task Analysis Volume III: Instructional Objectives,*** pp. 144-145.

SUPPLEMENTARY REFERENCES

Automotive Safety Foundation. ***A Resource Curriculum in Driver and Traffic Safety Education,*** pp. 24-26.

Brody, Leon and Stack, Herbert H. ***Highway Safety and Driver Education,*** p. 223.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 105, 112, 182, 202, 215, 252, 247, 367.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition,* pp. 137, 162.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Wet Surfaces

The student should know what adjustments to make in speed control, braking, and steering when driving on wet surfaces.

In rain and heavy fog, not only is visibility limited but the roadway becomes slippery and the car can go into a skid. Driving on a wet surface requires the driver to make adjustments in speed, braking, and turning, and allow additional following distance.

DRIVING TASK REQUIREMENTS

The student should know the procedures and hazards related to driving on wet surfaces.

General

When driving on a wet surface, the driver should:

Drive more slowly than on dry pavement.

Failure to adjust driving behavior to compensate for wet, slick surfaces is a contributing factor in a significant number of accidents.

The presence of water on the road reduces traction and increases the chances of skidding.

Increase following and lateral distances.

Maintain a smooth, even acceleration.

On slippery surfaces, major acceleration changes may spin the rear wheels and cause the car to start skidding.

Taking the foot off the accelerator suddenly on slippery surfaces may create an effect similar to the application of the brakes.

Alter speed and direction gradually, avoiding quick turns and sharp braking or downshifting.

A significant number of accidents each year is the result of too abrupt steering actions on wet surfaces.

The car could be thrown into a skid by the sudden introduction of engine braking power if the car is not moving very slowly at the time of shifting.

Decelerate further in advance of intersections, curves, and downgrades than is normally the case.

Allow for greater stopping distance.

Allowance should be made for 50 percent more distance when stopping on wet pavement.

Specific Procedures

When driving on a wet roadway, the driver should:

Anticipate less traction during the first moments of rainfall.

Oil on the roadway when mixed with water creates a slick surface, and care should be taken until there has been time for the rain to wash away the oil film.

Oil-soaked areas should be avoided, if possible. If they cannot be avoided, they should be negotiated at a slow speed in order to reduce skid potential.

Test braking response periodically by pumping the brake pedal lightly.

Moisture on the brake linings reduces braking power, and continued application of the brakes will dry the linings.

In cold, wet weather, the brake pedal should be depressed lightly and frequently to prevent the brakes from freezing.

Follow the tracks of other vehicles, if possible.

Water has been displaced in these tracks, and they offer a higher degree of friction.

When the water depth exceeds the depth of the tire treads, the driver should:

Drive at a more moderate speed.

Reducing speed under such conditions decreases the hazard of spot hydroplaning in which one or more tires are briefly waterborne as the car passes through the puddles. The risk of losing directional stability is high in spot hydroplaning conditions.

Decelerate as soon as the tires make a slushing sound.

Reducing speed when this slushing sound is noted may prevent hydroplaning. Hydroplaning occurs when the depth of the water, speed of the car, or condition of the tires prevents the tires from making contact with the road surface. Lack of traction greatly increases stopping distance and the chances of skidding.

Lack of tire tracks from other vehicles may indicate hydroplaning conditions.

Tires with a good conventional tread have a squeeze effect on wet pavement. Tires with worn, smooth treads do not and hydroplane more readily.

With normal tire inflation, minimum speed range for full hydroplaning is about 40-57 miles per hour. Once the tire becomes completely waterborne, stopping distance capability is lost and steering control almost totally ineffective. Under these conditions, a road irregularity, curve, crosswind, or other force will cause a complete loss of directional stability.

Where hydroplaning is a problem, highway engineers frequently cut grooves in the pavement to facilitate the dissipation of collected water.

Increase following distance behind large trucks.

The tires on large vehicles require much higher inflation pressure than do cars and are not as likely to hydroplane. If a truck decelerates ahead of a car that is hydroplaning and following at close range, the car would collide with the truck.

If hydroplaning occurs, ease pressure on the accelerator, rather than braking, to decelerate until the tires regain traction.

During hydroplaning, the front wheels are actually water skiing on a very thin film of water, and braking would cause loss of control of the car.

If deep water partially or totally covers the roadway, the driver should:

Decelerate in advance of the water.

Estimate the depth and extent of coverage.

Steer around the area if possible.

Proceed slowly and in low gear (manual transmission) through the water.

Excessive speed may splash water over the engine ignition system, causing the engine to stall.

After driving through the water, apply the brakes to see if they are operating properly.

Water on brake linings will reduce braking efficiency.

Testing brakes by tapping the brake pedal will indicate firmness of brake response. If brakes fail because of moisture, all brakes fail, including front wheel, rear wheel, and parking brakes. Attempts should be made to dry the brakes, if they are not operating properly:

Drive for a short distance with the right foot on the accelerator pedal and the left foot lightly depressing the brake pedal. This creates friction and heat which dry the brake linings. Repeat the procedure until the brakes respond normally.

Decelerate in advance of a bridge or culvert in wet weather at near freezing temperatures.

Water on a bridge or culvert will freeze more quickly than on the surrounding roadway.

Wet Leaves on Roadway

If approaching wet leaves on the roadway, the driver should:

Decelerate in advance of the affected area.

Wet leaves are almost as slippery as ice, especially on blacktop surfaces.

Maintain speed and direction with as little change as possible when driving through the area.

The student should know the skills required for driving on wet surfaces.

Stopping on a Wet Surface

The driver should be able to assess the condition of the roadway surface and make an estimate of the additional stopping distance needed when traveling at different speeds.

In conjunction with this assessment, the driver must also develop the ability to apply the right amount of brake pressure that will permit a normal stop on a wet surface.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to drive on wet surfaces.

Accelerator Pressure

When an inexperienced driver attempts to place the car in motion on a wet surface, the rear wheels may spin due to acceleration and reduced friction. The instructor should explain the need for gradual acceleration.

Brake Pressure

The beginning student frequently experiences some difficulty in coming to a normal stop on a wet surface. His inability to limit pressure on the brake pedal under this condition may result in a skid. The multiple car facility should be used for teaching student drivers to brake on a wet surface.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Automobile Tire Hydroplaning . . . What Happens!," 12 minutes, color, National Aeronautics and Space Administration.

"Tire Hydroplaning," 15 minutes, color, National Safety Council.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

American Automobile Association. ***Teacher's Handbook for Sportsmanlike Driving***, pp. 211-212.

Anderson, William G. ***Laboratory Manual for Learning to Drive***, p. 29.

Anderson, William G. ***Learning to Drive: Skills, Concepts, and Strategies***, pp. 215-219.

Anderson, William G. ***Teacher's Manual for Learning to Drive***, pp. 52-55.

Center for Safety Education, New York University. ***Driver Education and Traffic Safety***, pp. 206, 215-216.

McKnight, A. James and Adams, Bert B. ***Driver Education Task Analysis Volume I: Task Descriptions***, pp. 46-2 - 46-7.

McKnight, A. James and Hundt, Alan G. ***Driver Education Task Analysis Volume III: Instructional Objectives***, pp. 146-148.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 237-238.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, pp. 25-26, 36, 66.

Glenn, Harold T. *Youth at the Wheel*, p. 126.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 241-244.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), p. 73.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, p. 165.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 305-307.

Sand-Covered Roadways

The student should know the importance of driving safely on sand-covered roadways.

Sand on an otherwise normal roadway or dry pavement creates conditions similar to those caused by ice and snow. A car hitting sand at high speed on a normal roadway, or at normal speed on a curve, may go into a skid very easily because of the reduced traction. Thus, observing cues that indicate such road conditions is critical.

DRIVING TASK REQUIREMENTS

The student should know the procedures and hazards that pertain to driving on sand-covered roadways.

General

When driving through sand, the driver should

Shift into a lower gear just prior to entering a drift, if steering around it is impossible.

Drive at a reduced speed, maintain a smooth even acceleration, avoid quick turns, sharp braking, or downshifting when there is sand on the roadway.

Slow down further in advance of intersections, curves, and downgrades than is normally the case.

Stuck in the Sand

If the car becomes stuck in a sand drift the driver should

Keep the front wheels straight.

Place boards or heavy cloth in front of and in back of the rear wheels and then rock the car out of the drift by alternating between low gear and reverse.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	–	–

RESOURCE MATERIALS

The student should know the basic texts, periodicals and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 219-220.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 174-175.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, p. 46-12.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 162-163.

SUPPLEMENTARY REFERENCES

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, p. 66.

Glenn, Harold T. *Youth at the Wheel*, p. 182.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 192-193.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), pp. 73-74.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, p. 162.

Road Shoulders

The student should know the significance of road shoulders and the importance of being able to deal safely with them.

Road shoulders are a safety zone for a driver who may be forced to leave the roadway because of a car malfunction or because of the erratic behavior of another driver. While they are a safety zone, they may also be hazardous when the car has not decelerated before leaving the roadway.

DRIVING TASK REQUIREMENTS

The student should know the procedures and hazards related to the use of road shoulders.

Driving Precautions

The driver should know the effect that dropping or driving onto a roadway shoulder has upon operation of the car. To be able to deal safely and effectively with a shoulder, the driver should:

Periodically observe the condition of the shoulders—their firmness, width, surface condition and alignment with pavement.

A vertically misaligned road edge will tend to turn the front wheels; a vertical rise will turn them away from the roadway, and a vertical drop-off will turn them toward the roadway.

Check for obstructions such as signs and guardrails.

Maintain precise steering control and drive at a reduced speed when the shoulder is potentially hazardous or if there is no shoulder.

Accidentally Dropping Off Roadway

If one or two wheels accidentally drop off the pavement edge, the driver should:

Grasp the steering wheel firmly to keep the car traveling straight ahead.

Avoid any immediate attempt to bring the car back to the pavement.

Reduce speed gradually by easing the foot off the accelerator.

Abrupt braking may produce a skid and should be avoided. If it is necessary to brake, the brake pedal should be pumped gently.

Turn the steering wheel sharply counterclockwise to return the car to the pavement, starting far enough from the pavement edge to permit the wheels to turn.

Countersteer immediately to position the car in the lane and avoid crossing into adjacent or oncoming lanes.

The student should know the skills required for dealing effectively and safely with road shoulders.

The driver must be able to judge the amount of deceleration necessary before attempting to regain the roadway. He must maintain control of the car when conditions prevent deceleration before returning to the roadway.

Steering Techniques When Returning to the Roadway

Beginning drivers may have difficulty determining at what angle the wheels should be turned in order to safely return to the roadway. The wheels must be turned sharply in order to climb the pavement after speed has been reduced. A demonstration by the instructor may prove valuable to students having difficulty returning to the pavement.

Countersteering

In returning to the roadway the student driver may not countersteer to the proper degree. The instructor should immediately alert the student to avoid crossing to a far lane.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to deal effectively and safely with road shoulders.

Practical Instruction

Student drivers should have practical instruction on the procedures to follow when one or two wheels accidentally drop off the pavement onto the shoulder. Instruction should include the procedures for safely returning to the roadway. Student practice should be preceded by a demonstration of the correct techniques.

Brake Application When Wheel Drops Off Pavement

When one or two wheels unexpectedly drop off the pavement onto the shoulder the natural tendency of the driver, especially the beginning driver, is to apply the brake. Predriving instruction should stress the avoidance of brake application unless speed is very rapid, in which case the brake pedal should be pumped gently. If, in spite of predriving instruction, the student brakes during practical instruction the instructor should immediately tell him to release the brake and should review the off pavement procedures.

Maintaining Steering Control When Wheel Drops Off Pavement

Because the shoulder is not as smooth as the roadway, maintaining direction is more difficult. If properly briefed, inexperienced drivers in most cases will grasp steering wheel firmly to maintain directional control. Some students, however, may over-concentrate on the appropriate time to reduce speed and thus devote less than adequate attention to steering. Students who prematurely apply the brakes also will have difficulty maintaining directional control, because the car wheels may lock or the car may begin to skid. The instructor should identify procedural errors for students having difficulty maintaining direction after dropping onto the shoulder. Verbal cues should be used when necessary.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	—	—

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Wheels off Pavement," filmstrip, 48 frames, color, Ford Motor Company.

Simulator Films

"Driving Emergencies,"* 16 minutes, color, AEtna Life & Casualty Co.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide materials for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty in consultation with Popyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System,* film section "Driving Emergencies," AEtna Life and Casualty Co.

Allstate Insurance Company. *Allstate Good Driver Trainer System,* film booklet "Hazardous Situations."

American Automobile Association. *Practice Driving Guide for Use with Sportsmanlike Driving,* p. 24.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 170-171.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies,* p. 229.

Anderson, William G. *Teacher's Manual for Learning to Drive,* pp. 56-59.

Center for Safety Education, New York University. *Driver Education and Traffic Safety,* pp. 269-270.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 46-12 - 46-15.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives,* pp. 150-151.

SUPPLEMENTARY REFERENCES

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 137, 184-185, 264-265, 358.

"If There's Trouble on a Car Trip," *Changing Times,* pp. 26-27, The Kiplinger Washington Editor's Inc., Washington, D.C. August 1964.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser-Aaron), p. 69.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Obstructions and and Barricades

The student should know the significance of roadway obstructions and barricades.

Obstructions and barricades in the roadway indicate there may be road repairs, men working, a detour, or only one lane open for both directions of traffic. Driving safely where abnormal road conditions exist will keep traffic moving, reduce the chance of accident, and maintain a nonhazardous environment for individuals working in the area.

DRIVING TASK REQUIREMENTS

The student should know the procedures and hazards associated with roadway obstructions and barricades.

Debris and Objects on Roadway

When objects such as rocks, glass, or branches are detected on the roadway, the driver should

Slow down before reaching the objects and attempt to straddle or steer around them.

Avoid sudden or large turns that might result in a skid.

Wait for a break in opposing traffic before proceeding when steering around an object requires driving in the opposing lane.

Maintain a reduced rate of speed until clear of object(s).

After Heavy Rains

After prolonged or heavy rains, the driver should

Watch for large collections of water on the roadway.

Watch for rockslides and debris, particularly in the outside lane.

Road Construction and Barricades

The driver should look for warning signs indicating roadway obstructions, construction, or road repairs ahead. The sound of air hammers or heavy machinery and the movement of men, trucks, or heavy equipment indicate the presence of roadway construction or repair. When driving through an area of road construction or repair or going around a barricade the driver should maintain a reduced rate of speed and follow flagmen's signals and detour instructions.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--

FILMS/FILMSTRIPS/SLIDES

Simulator Films

"Intermediate Traffic,"* 22 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System*, film section "Highway Driving," AEtna Life and Casualty Co.

Allstate Insurance Company. *Allstate Good Driver Trainer System*, film booklet "Intermediate Traffic," Allstate Enterprises Inc.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 46-14 - 46-17.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 152-154.

SUPPLEMENTARY REFERENCES

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, pp. 140-141.

"Illinois Establishes New Barricade Warning System," *Traffic Safety*, pp. 20-21, vol 71 no 1, January 1971.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, p. 167.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Snow and Ice

The student should know how to operate a car safely on roadways covered with ice or snow.

Traction is reduced when the roadway is icy or snow-covered. Since cars steer by traction, care must be taken not to steer abruptly; since braking too sharply can cause a skid, care must be taken to brake properly. These two factors—steering and braking—plus speed control, affect the safe negotiation of icy and snow-covered roadways.

DRIVING TASK REQUIREMENTS

The student should know the procedures and hazards that relate to driving on icy and snow-covered roadways.

General

In general, when driving on a snow- or ice-covered roadway, the driver should:

Drive more slowly than on dry pavement.

Thirty percent of all accidents and 20 percent of all fatalities occur on wet, icy, or snowy roads.

Failure to modify driving behavior in order to compensate for wet, slick surfaces is a contributing factor in a significant number of accidents.

The presence of water, ice, or snow on the road reduces the coefficient of friction, increasing stopping distance and the probability of skidding.

Increase following and lateral distances.

Maintain smooth, even acceleration.

On slippery surfaces, marked acceleration changes may spin the rear wheels and cause the car to start skidding.

Taking the foot off the accelerator suddenly on slippery surfaces may create an effect similar to the application of brakes.

Alter speed and direction of travel gradually.

Quick turns and sharp braking or downshifting should be avoided.

A sudden application of braking power by downshifting when the car has not decelerated enough can throw the car into a skid.

Deceleration should be greater than is normally the case in advance of intersections, curves, and downgrades.

Greater stopping distances should be anticipated.

Reducing speed well in advance of an intersection helps assure the ability to stop prior to the intersection. In addition, snow or ice tends to remain longer near an intersection because of the effects of plowing and the reduced speed of vehicles over it.

Judge the effect of traffic and temperature on road surface friction.

Heavy traffic may polish the ice, making the ice warmer. Ice at 30 degrees F. is twice as slippery as ice at 0 degrees F.

Observe traffic approaching on side streets, checking to see if any vehicle is skidding.

Watch for children sledding or playing.

Install chains or snow tires for driving on snow emergency routes.

Snow emergency routes are generally arterial roadways whose obstruction will create extensive traffic delays. Many cities require vehicles using these routes to have chains or snow tires.

Drivers using chains should tighten the chains as necessary and should maintain a speed appropriate to conditions. Driving too fast for conditions will negate the traction and stopping ability that chains provide.

Chains should be removed when the roadway is clear.

When starting the car in motion through the snow, the driver should:

Accelerate slowly to avoid spinning the rear wheels.

Keep the front wheels straight.

Back the car a few feet, then move forward in the same tracks, negotiating the hump of snow at the end of the tire tracks before attempting to turn.

Turning the wheels, which creates additional resistance, should not be attempted unless the car has sufficient momentum.

If the car becomes stuck in the snow, the driver should:

Avoid sitting in the car with windows closed and the engine running.

The hot exhaust creates a hole in the snow in which carbon monixide can accumulate and may seep back into the car.

Use a shovel (or base plate of jack) to remove snow and slush in front of and behind each wheel.

Remove snow from around the tail pipe area.

Snow forced up the tail pipe may stall the engine.

"Rock" the car by alternating between reverse and low gear.

This procedure should be continued until the car has made a path through the snowdrift.

In negotiating deep snow, the driver should:

Shift into lower gear (in a manual transmission car) before entering the deep area.

The resistance created by deep snow requires more power for the rear wheels. Low gear increases the power to the rear wheels and lessens the strain on the engine.

Attempt to keep the car moving through the snow.

When stopping the car in snow, the driver should:

Allow sufficient room to stop, braking early for the stop.

Select a location where traction will be most effective, such as bare pavement or loose snow. Traffic-packed snow should be avoided.

The car can usually be steered safely into a snowdrift if an emergency stop is required.

Avoid stopping on an upgrade, if possible.

Stopping on an upgrade increases the resistance to forward motion, increasing the likelihood that the wheels will spin when power is applied.

It is usually better to stop in advance of an upgrade if the need to stop can be anticipated.

When parking in heavy snow conditions, the driver should:

Look for curb and sufrace markings that may restrict parking.

Avoid a parking space that would not permit the car to get in close to the curb.

If the car projects into the traffic lane, it may impede traffic.

Avoid parking on a grade where a downgrade exit is not possible.

When starting the car in motion on an ice-covered roadway, the driver should:

Place sand, salt, cinders, traction mats, or other material in back and front of the rear wheels.

Start the car slowly to avoid spinning the wheels.

In a manual shift car, second or high gear should be used, in an automatic shift car, the drive range.

When driving on ice at about freezing temperatures, the driver should:

Approach curves and intersections slowly.

Reduce speed even more if the ice is melting.

Increase following distance to compensate for a more slippery surface.

A thin layer of water on top of the ice makes the ice even more slick.

Look for ice patches near shaded areas, such as underpasses.

Patches of ice tend to linger in shaded areas where melting does not occur as quickly.

Watch for spots where direct sunlight may have accelerated melting.

Because melting ice is more slippery, sunny areas are more dangerous when most of the roadway is covered with snow or ice.

On multilane roadways, avoid passing in the far left lane because this lane is likely to have patch ice.

Passing lanes have less traffic than outside lanes, where the heavier traffic will wear off ice and snow faster.

When encountering patches of ice on the roadway, the driver should:

Slow down before reaching the area.

Patch ice or snow causes about one-third of the accidents on icy and snow-covered roadways.

Maintain a straight course and a constant speed through the patch area, avoiding braking and changes in steering.

Abrupt attempts to change the speed or direction of the car may cause a skid.

Anticipate other patches of ice on the roadway.

If attempting to stop on ice, the driver should:

Pump the brake pedal rapidly to apply and release the brake.

Pumping the brakes allows the wheels to revolve intermittently and avoid skidding. Jamming on the brakes causes the wheel to lock which produces a skid.

Hold the steering wheel firmly, applying steering corrections while the foot is off the brake.

When driving on snow- and/or ice-covered grades, the driver should:

Maintain a constant speed or accelerate slightly on the approach to an upgrade.

Maintain constant pressure on the accelerator on the upgrade.

While the car will lose speed as it climbs, the tires are less likely to lose their grip and spin if a constant pressure is applied to the accelerator.

Decelerate in advance of downgrades.

It may be necessary to downshift before the downgrade to minimize the need for downhill braking.

The student should know the skills required for driving, stopping, and parking on ice- and snow-covered roadways.

Accelerating from a Parked or Standing Position

The driver must be able to place the car in motion from a standing or parked position without causing the rear wheels to spin or the car to slide laterally. To do so, he must be able to apply the right amount of pressure to the accelerator so that the car begins to move slowly, without the wheels spinning or the direction of the car shifting.

When attempting to move the car from a parked position in snow, the driver may find it necessary to "rock" the car. This requires the driver to estimate when it is time to shift from forward and reverse and vice versa. It also requires him to know how much pressure to put on the accelerator without causing the wheels to spin.

Accelerating on Snow- or Ice-Covered Grades

To keep the car in motion on icy or snow-covered grades, the driver must be able to estimate the amount of accelerator pressure needed to reach the crest of the hill. Applying too much pressure may cause skidding.

Stopping on Icy or Snow-Covered Roadways

To be able to stop safely on icy or snow-covered roadways, the driver must assess the condition of the roadway surface and estimate the extra required stopping distance.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to drive on icy or snow-covered roadways.

Accelerator Pressure

An inexperienced driver may cause the car's rear wheels to spin when attempting to place the car in motion on a slippery surface or on an upgrade. The instructor should emphasize the need for gently depressing the accelerator and for holding it steady once the car is moving. In cold winter climates, the skid pan area on a multiple car facility may be used for practice in accelerating on an icy surface. The inexperienced driver should be allowed to "overaccelerate" in a safe practice area. By trial and error the beginning driver should be able to develop the ability to accelerate at a rate that does not cause the car to slide laterally or the rear wheels to spin.

Stopping on Slippery Surfaces

The beginning driver frequently experiences difficulty in bringing the car to a safe stop on an icy or snow-covered surface. The instructor should remind the driver that because of the reduced surface friction the stopping distance for any given rate of speed will be greater than the stopping distance of the same speed on a dry surface. As a result the driver must begin to stop sooner. In addition, the driver must know how much pressure to apply to the brake pedal to stop the car without going into a skid.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	Source	Title
Chalkboard and traffic situation board	--	--
Chalkboard or traffic situation board for in-car use	--	--
Classroom poster	Safe Winter Driving League	"Braking Distance on Glare Ice and on Dry Pavement"
Handouts/Pamphlets	American Automobile Assoc.	"How to Go on Ice and Snow"
	Ontario Dept. of Transport	"You Can Outwit Old Man Winter if you Know the Tricks for Safe Winter Driving"

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Don't Skid Yourself," 13 minutes, AEtna Life Insurance Company.

"Driving in Bad Weather," 10 minutes, color, Ford Motor Company.

"Driving Under Special Conditions," 19 minutes, b/w, Ford Motor Company.

"Driving Under Adverse Conditions,"* 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

"Skids and Skidding,"* 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

"Sliding for Safety," 20 minutes, b/w, University of Wisconsin, Bureau of Audio-visual Instruction.

"What About Winter Driving," 14 minutes, color, National Safety Council.

"Winter Driving," 24 minutes, State of Wisconsin Division of Motor Vehicles.

Simulator Films

"Good Driving in Bad Weather," 20 minutes, color, AEtna Life & Casualty Co.

"Winterproof Your Driving," 16 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System,* film section "Driving in Bad Weather."

Allstate Insurance Company. *Allstate Good Driver Trainer System,* film booklet "Winterproof Your Driving."

American Automobile Association. *Practice Driving Guide for Use with Sportsmanlike Driving,* pp. 29-30.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 216-224.

Anderson, William G. *Laboratory Manual for Learning to Drive,* p. 29.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies,* pp. 209-215, 219.

Anderson, William G. *Teacher's Manual for Learning to Drive,* pp. 52-55.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

BASIC REFERENCES (Continued)

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 174-183.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 46-2, 46-3, 46-6 - 46-13.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 156-160.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers*, pp. 77-79.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 237-238.

American Automobile Association. *Sportsmanlike Driving: Teacher's Guide*, pp. 45-48.

American Automobile Association. *Teaching Driver and Traffic Safety Education*, pp. 205-207, 217-230.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, pp. 25-26, 36, 64-67.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 182-188.

Glenn, Harold T. *Youth at the Wheel*, pp. 224-233.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 248-251.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), p. 73.

Overend, Robert B. "The Great Studded Tire Controversy," *Traffic Safety*, vol. 71, no. 12, pp. 8-10, 35-39, December 1971.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 160-161, 163.

Weather Conditions and Limited Visibility

The student should know and be able to carry out the procedures required by limited visibility, wind, temperature extremes, and other adverse weather conditions.

When encountering weather conditions that limit visibility and otherwise make driving hazardous, a driver, as quickly as possible, should select the most effective procedures for improving driving conditions and keeping traffic moving.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws that pertain to safe driving during periods of limited visibility and other adverse weather conditions.

General Precautions During Limited Visibility

During rain, sleet, snow, hail, fog, sun glare, or blowing sand, the driver should:

Drive more slowly than under normal conditions.

Limited visibility due to fog or precipitation is a contributing factor in a significant number of accidents.

Increase following time and distance to compensate for reduced viewing distance.

Drive in the lane that permits greater separation from oncoming traffic.

Reduced visibility increases the chances of the driver of an oncoming vehicle becoming confused and entering an opposing traffic lane, particularly at night when water on pavement dissipates light and obscures lane markings.

Watch vehicular and pedestrian traffic more closely.

Maintaining View Through Windshield and Windows

When the driver's view through the windshield is obscured by precipitation or road spray, he should:

Turn on the windshield wipers to clear the windshield, using washers, as necessary.

If vacuum-type wipers slow down, the foot should be lifted briefly from the accelerator.

When the view is obscured by frost or ice on the windshield, the driver should:

Use the defrosters with the windshield wipers to keep the windshield clear.

Defrosters bring in outside air to dry the inside glass and to keep additional condensation from forming.

If the defroster does not work, time should be taken to allow the heater to warm up the windows; or glycerine or alcohol can be applied to the outside of the windshield to help clear the glass temporarily.

Avoid using the windshield washers, even if with antifreeze, in extreme cold.

The spray may freeze on the windshield and obstruct the view still further.

When the view through the windshield is obscured by condensation from occupants' breath or in humid or cold weather, the driver should:

Turn on the defroster and adjust the temperature setting as necessary.

Open vent window if additional outside air is needed.

An open window helps reduce the humidity level inside the car and the temperature difference between the outer and inner windshield.

Stop the car and remove heavy moisture from side windows, as well as the windshield, with a cloth or paper towel.

Using the hand to remove condensation from glass is likely to leave an oily residue and result in later streaking.

Dew or moisture from fog can be removed from side windows by rolling them down and back up.

Maintaining Visibility In Fog or Rain

When visibility is reduced during the day or night by fog or heavy precipitation, the driver should:

Turn on the low beam headlights.

A car with its low beam headlights on can be seen at much greater distances by oncoming and following drivers. Parking lights are inadequate and sidelights are ineffective in fog, because they often are not visible until the car is outlined.

Fog lights should be positioned low to be effective.

Reduce speed so as not to overdrive visibility.

Use pavement markings, particularly those on the right side, and other vehicle lights as longitudinal and lateral cues.

Stop at roadside to wait until heavy rain subsides.

Severe downpours are usually of short duration.

Sunglare

When sunglare is blinding, the driver should:

Adjust the sun visor to shield the eyes without obstructing view, and/or wear sunglasses.

Look down at the roadway in front of the car, not directly into the sun.

Sandstorm

During a sandstorm, which reduces visibility, the driver should:

Grasp the steering wheel firmly.

Ridges of drifting sand will increase resistance and may turn the wheels.

Proceed slowly, or stop at the roadside if visibility is severely restricted.

Watch for lane markings that may be partially obscured by drifting sand.

Extreme Heat

During extreme heat, the driver should:

Make the car as comfortable as possible by turning on the air conditioner or opening the windows.

Watch the temperature gauge for signs that the car is overheating.

Avoid prolonged high-speed driving.

Prolonged high speed driving causes excessive tire wear and increases tire temperature, creating the danger of a blowout. It may also cause the engine to overheat.

Maintain circulation in the cooling system.

At low speeds in heavy traffic, a lower gear should be used.

When standing in heavy traffic, the gearshift should be placed in neutral and the engine raced to make the fan turn faster, thus cooling the radiator coolant more quickly. Racing the engine also helps prevent vapor lock (vaporization of gasoline in the fuel line) and keeps the car from stalling.

Let the engine idle for a few minutes when stopping after a long run.

Letting the engine idle in this manner helps prevent vapor lock and makes the engine easier to restart.

Extreme Cold

During extreme cold, the driver should:

Turn on the heater after the engine has warmed.

Watch the temperature gauge for signs of overheating.

Keep the fuel tank nearly full.

During cold weather, moisture in the air will condense as water in the fuel tank, may freeze and block the fuel lines.

Remove frost or condensation as indicated above.

In an automatic transmission car, place the gearshift lever in park and leave the parking brake off.

During extremely cold weather, brake linings may freeze to the brake drum, making it impossible to disengage the brakes.

After parking in freezing rain, place cardboard or newspaper under the wipers to keep ice from forming on the windshield.

Freezing Temperature Drop After Rainfall

When a rapid temperature drop occurs after rainfall, the driver should:

Watch for ice patches on the roadway.

Test brakes periodically.

Moisture collecting on brake linings may freeze and reduce braking power.

Wind

When driving with a high steady or intermittent crosswind, the driver should:

Drive at lower than normal speeds.

Driver perception, reaction, and correction time are critical determinants of safe speed in a crosswind.

Steer toward the wind, firmly grasping the steering wheel, when the car's lateral positioning is altered by the wind.

Continuing in a straight-line steering course without correction will cause the car to cross into the adjacent lane or to steer off the road. The amount of corrective torque required to prevent lateral deviation decreases with a decrease in speed.

Avoid oversteering in reacting to gusts of wind.

Gusts produce rapid changes in lateral positioning, necessitating a greater degree of steering which may result in oversteering.

Anticipate steering corrections when the wind is screened by hills, buildings, or larger vehicles.

Keep windows closed as much as possible to reduce noise and dust.

The student should know the skills required for driving safely during periods of limited visibility and other adverse weather conditions.

The driver should be able to locate, by touch or with a glance, and operate the accessories and controls for improving his visibility. Since the roadway and surrounding environment will require all of his attention during conditions of reduced visibility, he must know the location of the windshield wiper and washer controls, the heater, and defroster, and be able to activate them without taking his eyes off the road.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to drive safely during periods of limited visibility and other adverse weather conditions.

Estimating Steering Correction

Maintaining directional control in a high crosswind requires the student to make rapid corrections by turning the wheel just enough to regain the desired path without oversteering. Many student drivers will have difficulty in estimating the amount of steering correction that is necessary.

Oversteering

Student drivers encountering steering problems on windy days may have a tendency to oversteer. Maintaining directional control without overcorrecting should become easier with more practice.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	–	–
Handout/pamphlet	National Safety Council	"Good Visibility is a must" fact sheet

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Sudden Loss of Vision, 41 frames, color, Ford Motor Company.

Simulator Films

"Good Driving in Bad Weather,"* 20 minutes, color, AEtna Life & Casualty Co.

RESOURCE MATERIALS

The student should know the basic texts, periodicals and reports that will provide materials for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty in consultation with Papyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System*, film section "Driving in Bad Weather," AEtna Life and Casualty Co.

American Automobile Association. *Practice Driving Guide for Use with Sportsmanlike Driving*, p. 30.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 216-217, 224-227, 281, 283, 333-334.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies*, p. 218.

Anderson, William G. *Teacher's Manual for Learning to Drive*, pp. 52-65.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 42, 61.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers*, p. 75-77.

*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

BASIC REFERENCES (Continued)

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 51-0 - 51-5.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 188-195.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 237-238.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, pp. 28, 46-47.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, p. 223.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 48-49.

Glenn, Harold T. *Youth at the Wheel*, pp. 222-224, 318-320, 327.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*. pp. 203, 238-247.

Kearney, Paul W. *How to Drive Better and Avoid Accidents*, p. 224.

National Education Association, National Commission on Safety Education. *How Experienced Teachers Develop Good Traffic Citizens: Tips and Cues*, pp. 53-55.

National Highway Safety Bureau. *Maximum Safe Speed for Motor Vehicles*, pp. 6, 29. NHSB Staff Report, Department of Transportation, January 31, 1969.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), pp. 72-73.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 159-161.

Strasser, Marland K., Eales, John R., and Aaron, James F. *Driver Education: Learning to Drive Defensively*, pp. 203, 205, 284-285, 300-304, 307.

III-B-4

Night Driving

Night Driving

The student should know what adjustments he must make when driving at night to compensate for limited vision and visibility.

Driving at night is more difficult and hazardous because of the limitations that darkness places on the driver's vision as well as on his visibility of the driving environment.

DRIVING TASK REQUIREMENTS

The student should know the procedures and hazards that pertain to driving a car during darkness.

General

More than half of all motor vehicle deaths occur at night. The death rate at night per 100 million vehicle miles is more than two and one-half times the death rate during daylight hours, and in urban locations the rate increases to three times. Fatal accidents occur most frequently, according to Accident Facts, during the evening rush on weekdays (except Fridays), late Friday night, late Saturday afternoon and night, and early Sunday morning.

In general, during conditions of darkness, the driver should:

Drive with the headlights on.

Failure to turn on headlights for night driving is the cause of a significant number of accidents.

As a rule, low beam headlights should be used. The use of parking lights at dusk should be avoided when driving and is illegal in some states because they (1) are too weak and cannot be seen adequately, and (2) may be confused for headlights, causing misestimation of distance by others.

Drive more slowly than during daylight.

Maintain a speed that permits him to stop within the distance illuminated by the headlights.

Low beams in good condition are effective about 150 feet, high beams 350-500 feet. If a driver is driving too fast to stop within this distance, he is "overdriving" his headlights.

Sight distance at night is dependent on the speed of the car. The driver can see 80 feet farther at 20 miles per hour than at 60 miles per hour.

Clear seeing distances decrease in daytime by about 20 feet for each increase of 10 miles per hour. At night, these distances are further reduced.

Headlights give greater visibility on wet roads than on dry roads. This is because light on wet roads has less diffusing quality; less light from the car's headlights is reflected back to the driver's eyes and more light reflected ahead.

Watch for dark or dim objects on the roadway.

Dark objects are visible in headlight illumination at about half the distance that white objects are. With opposing headlight glare, the visibility of dark objects is reduced further by about one-half.

At night, drivers are able to see best those pedestrians in reflectorized clothing; white next, then grey, then black the least.

As illumination decreases, peripheral as well as central visual acuity lessens. By cocking his head to one side and peering out the corner of his eye the driver is able to see better.

Watch beyond headlights, on and near the roadway, for slow-moving or unlit vehicles, curves, road obstructions or defects, pedestrians, and animals.

Allow a greater margin of safety in the performance of maneuvers than during daylight.

Following distance should be increased.

Acceptable passing distance and time should be increased.

Refrain from using matches or bright lights inside the car.

It is important to keep the eyes adapted to the darkness.

Bright lights inside the car may reduce visibility by producing glare on the windshield or windows.

Adjust panel light intensity so that visibility improves outside the car but vision inside the car is sufficient.

Avoid fatigue and maintain visual efficiency by keeping the car well ventilated and taking frequent rest stops.

High altitude adversely affects visual efficiency at night by reducing oxygen in the blood. Smoking has a similar effect.

Urban Driving

When driving in urban areas, the driver should:

Check to see that the headlights are on when leaving a parking space, particularly in brightly illuminated areas where the absence of headlights may not be immediately noticeable.

Use low beam headlights to avoid blinding other drivers and pedestrians.

Watch for pedestrians and unlit vehicles and objects on the roadway and at curbside.

When there are no traffic speed regulations in dimly lit areas, limit maximum speed to 30 miles per hour on dry pavement and 25 miles per hour on wet pavement.

Rural Driving

When driving in rural areas, the driver should:

Drive at a speed appropriate for conditions.

Conditions associated with rural roads, such as curves, hills, and narrow roadways, essentially limit safe speeds to 50-60 miles per hour.

Use high beam headlights except when approaching an oncoming vehicle or when overtaking a vehicle.

When approaching an oncoming vehicle in a rural area, the driver should:

Use low beam headlights.

High beams will blind the driver of an oncoming vehicle.

Decelerate.

Flick headlights to high then low beams once or twice, if necessary to remind an oncoming driver to dim his headlights.

When the driver of an oncoming vehicle refuses to dim his headlights the driver should:

Decelerate.

Maintain his own headlights on low beam.

Deliberately leaving highbeam headlights on compounds an already hazardous situation.

Avoid looking directly at the vehicle's bright lights.

Focus his eyes to the right side of the roadway beyond the oncoming vehicle.

Focusing on the right side of the roadway beyond the oncoming vehicle offsets the blinding effect of headlight glare. Peripheral vision will keep the car driver cognizant of the oncoming vehicle.

For a few moments close one eye as the oncoming vehicle draws near.

Maintain a slower speed for a period of time after the vehicle has passed.

When following another vehicle in a rural area the driver should:

Use the taillights of the vehicle as an indication of closing rate.

Dim the headlights when 500 feet away from the vehicle.

The visibility of the driver of the vehicle can be impaired by glare caused by headlights shining in his rearview mirror.

Increase following distance.

When being followed in a rural area by another vehicle with bright lights, the driver should:

Flick his headlights from high to low beam once or twice as a reminder to the following driver to dim his lights. If he does not dim his lights, the driver should:

Decelerate gradually and keep to the right of the roadway.

Permit the vehicle following to pass at the first safe opportunity.

Avoid looking directly at the rearview mirror.

Adjust the day/night mirror to the night position.

When approaching a pedestrian or animal in a rural area at night, the driver should:

Dim the headlights.

Decelerate.

Watch the pedestrian or animal for indication of a change in direction or movement.

Prepare to take evasive action should the pedestrian or animal enter the roadway.

When approaching an animal refuge or crossing area, reduce speed and watch for animals on or alongside the roadway.

Driving at Dusk/Dawn or on Dark Days

Most people experience heightened depth impressions at dusk. Objects at different depths appear farther apart at this time than in bright daylight. When driving at dusk or dawn or on dark days, the driver should:

Use low beam headlights.

Drive more slowly than normally, giving increased attention to traffic.

One-fifth of all motorists in fatal traffic accidents are fatally injured during the time period between 5 p.m. and 8 p.m.

Remove sunglasses or tinted eyeglasses at dusk.

- Sunglasses worn at night decrease light still further. However, wearing sunglasses during the day aids night vision because less time is required for the eyes to adapt to darkness.

Use nontinted contact lenses from dusk on.

Tinted contact lenses absorb from 10 to 20 percent more light than clear glass.

Parking on Shoulder

When parking on the road shoulder during darkness, the driver should:

Position the car well off to the right of the roadway.

Use four-way flasher units to warn other drivers.

The student should know the skills required for night driving.

The driver must be able to keep sight of an oncoming vehicle with his peripheral vision and to maintain his car on its path by focusing along the right edge of his lane until the oncoming vehicle has passed.

He must develop the skills of judging distances, closing rates, and performances of all other normal daytime driving behaviors under conditions of altered, reduced or distorted visual information.

He must learn to overcome the stresses produced by the perceptual problems of night driving since these stresses can seriously alter his judgment, perception, and psychomotor ability.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to drive in darkness.

Maintaining Direction When Opposing Traffic Approaches

Driving at night presents a visibility problem. The driver must maintain position within the driving lane when the headlights of oncoming traffic reduce his visual efficiency. The procedures for maintaining position involve the use of peripheral vision and some skill in steering and visual coordination.

In order to maintain direction, the beginning driver must learn to focus along the right edge of his lane when oncoming traffic limits his visibility. An indication that the driver is not focusing on the roadway edge is his inability to maintain directional control when oncoming traffic is present. A simple verbal cue should help to correct the difficulty. If learning difficulties during darkness persist the student may have impaired vision.

Judgments at Night

Because darkness affects the driver's ability to see, judgments of distances and closing rates will vary from judgments made during daylight hours. The beginning driver may overtake a vehicle at too great a speed or attempt to turn before it is safe to do so. He must learn to accept the effects of darkness upon his judgment. The instructor might identify some cues that the student can use in estimating distance and closing rate. For example, the distance between taillights or headlights on a vehicle ahead or an oncoming vehicle aids the driver in estimating distance and/or closing rate. In addition, the instructor should make the student aware of the range of the car headlights and the impact of opposing headlights on the driver's night vision.

Tension

Inexperienced drivers are especially susceptible to becoming tense when driving in darkness, because of the perceptual difficulties experienced at night. Being under stress can seriously alter the driver's judgment, perception, and psychomotor ability. Driving in a less populated area may aid the tense student since there are likely to be fewer environmental stimuli to which the driver must respond.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--
Handouts/pamphlets	National Safety Council	"Driving in the Dark" "Night Driving" data sheet "Night Driving" fact sheet

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Driving at Night," 10 minutes, color, Ford Motor Co.

"Lights Have Limits," Driver Education Films Series, 4½ minutes, b/w, American Oil Co.

"Night and Bad Weather Driving," 11 minutes, b/w, Progressive Pictures.

"Night Driving and Emergency Situations," No. 5, Safety Features Series, Indiana University.

"Night Driving and Seeing," 30 minutes, Educational Television film. Order from University of Nebraska.

"Night Driving Tactics" 17 minutes, color, Charles Cahill Associates, Inc.

RESOURCE MATERIALS

The student should know the basic texts, periodicals and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

American Automobile Association. *Practice Driving Guide for Use With Sportsmanlike Driving*, p. 30.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 44-49, 224-225.

Anderson, William G. *In-Car Instruction: Methods and Content*, pp. 284-285.

Anderson, William G. *Laboratory Manual for Learning to Drive*, p. 27.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies*, pp. 200-208.

Anderson, William G. *Teacher's Manual for Learning to Drive*, pp. 52-55.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 95-97.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers*, pp. 73-75.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 52-0 - 52-7.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 196-200.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 235-237.

American Automobile Association. *Sportsmanlike Driving: Teacher's Guide*, pp. 35-36.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, p. 47.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, pp. 223-224.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 107-109.

Glenn, Harold T. *Youth at the Wheel*, pp. 82-86, 219-222, 254-257.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 125, 188-191, 202, 229, 252-253, 275-276.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), pp. 64-65.

"Optometrists Evaluate Role of Eyes in Night Driving," *Traffic Safety*, vol 71 no 7, p. 24, July 1971.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 127, 155, 157-159.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 52-54, 297, 303.

III-B-5

Special Conditions

Towing a Trailer
Hauling Loads
On-Road Malfunctions and Breakdowns
Pushing/Towing

538-604 O - 74 - 24

Towing a Trailer

The student should know how to adjust his driving to compensate for the effects of towing a trailer.

Towing a trailer requires special driving techniques so that the trailer does not swing into another vehicle, cut across a corner, or otherwise threaten the safety of other motorists and the smooth flow of traffic.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws that pertain to towing a trailer.

Accelerating With a Trailer

Towing a trailer requires some modifications in normal driving behavior and extra care in performing maneuvers gradually and smoothly. When towing a trailer the driver should

Accelerate slowly and smoothly, keeping to the right side of the roadway and maintaining a greater than normal following distance.

Check the security of the trailer and the condition of the tires periodically.

Reduce speed if necessary and remain to the extreme right side of the roadway when meeting oncoming traffic, applying the trailer brakes lightly to diminish trailer sway.

Pass slower vehicles only after checking traffic to the front and rear, being sure to position the car sufficiently to the left of the vehicle being passed.

Accommodate passing vehicles by reducing speed to provide a larger gap if necessary and by moving as far to the right of the roadway as is safely possible.

Backing, Slowing, and Stopping With a Trailer

In backing up, slowing down, and stopping with a trailer in tow, the driver should

Back the trailer in the desired direction by backing the car in the opposite direction after having checked to the rear and side to be sure there is no traffic and there is sufficient clearance.

Make gradual steering movements when turning while backing with a trailer attached.

Apply trailer brakes first, then the car brakes to come to a normal safe stop. Trailer brakes are applied by a quick on and off motion; the car brakes are applied gradually and intermittently.

Negotiating Corners, Curves, and Hills With a Trailer

When turning corners, taking curves, and driving on hills or winding roads with a trailer in tow, the driver should:

Drive at a reduced speed, allowing sufficient distance for turning safely.

Position the car in the extreme right side of the roadway, allowing faster traffic to pass when passing is permitted.

Shift to a lower gear and remain to the right on long and/or steep downgrades.

Use a wider turning radius at intersections to prevent the trailer from climbing the curb.

Towing a Trailer on Windy Days

When towing a trailer on windy days the driver should:

Slow down and keep to the extreme right of the roadway.

Leave the roadway if winds are excessive.

The student should know the skills required for towing a trailer.

The driver must be able to judge the effect of the trailer and load upon the car's accelerative and braking response; judge the path the trailer will make in turning corners in order that both car and trailer remain within limits prescribed for turning; and associate turning motions of the car with those of the trailer in backing in order that both car and trailer remain on the desired path.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to tow a trailer.

Braking With a Trailer in Tow

The added weight of a trailer will require a greater-than-normal stopping distance. The driver must determine the additional amount of stopping distance required when driving at different speeds so that he can stop gradually and smoothly. This determination must be made through trial and error.

The driver also must learn to recognize when it is necessary to apply the trailer brakes in addition to the car brakes. If the trailer begins to sway, a slight application of the trailer brakes is necessary. Drivers who have had little or no experience towing trailers may have some difficulty coordinating the application of car and trailer brakes.

Turning With a Trailer in Tow

Drivers towing trailers may have some difficulty estimating the path the trailer will take in turning corners. Turns should be gradual and at reduced speed in an effort to minimize the possibility of running over the curb with a trailer wheel. Similar precautions must be taken when towing a trailer and encountering sharp curves in the roadway.

Backing With a Trailer in Tow

One of the most difficult maneuvers when towing a trailer is backing. The driver is likely to have difficulty associating turning motions of the car with those of the trailer. Maintaining both car and trailer on the desired path while backing will require practice. While he is backing up he must also control speed by coordinating the accelerator with brake or clutch control. Steering skills are also required.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--
Handout	Country Life Ins. Co.	"Trailer-Wise"

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 413-415.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 61-0 - 61-7.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 202-205.

Air Force Driver. *Tricks of the Tow*, vol. 5, no.6, pp. 14-17, November 1971.

SUPPLEMENTARY REFERENCES

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, p. 28.

Glenn, Harold T. *Youth at the Wheel*, p. 320.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 207-208.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 164, 314-316.

Hauling Loads

The student should know how to compensate for the effects of hauling heavy loads within or on top of the car.

When a car is heavily loaded, its center of gravity is altered, and accelerative, braking, and steering capabilities are affected. The driver must adjust his driving behavior accordingly.

DRIVING TASK REQUIREMENTS

The student should know the procedures and hazards associated with hauling loads inside or on top of the car.

General

When the car is heavily loaded, the driver should:

Begin slowing down for a stop sooner than would be necessary if the car were lightly loaded.

A loaded car requires more braking distance.

Allow greater separation distance between the car and the vehicle ahead.

Drive at a slower than normal rate of speed.

Perform maneuvers and movements gradually, avoiding abrupt actions.

Check the tire pressure frequently so that the recommended pressure can be maintained.

Inspect the load periodically to make sure it is properly restrained and has not shifted.

Loads Within the Car

When hauling loads within the trunk or rear passenger area, the driver should:

Make sure he has clear visibility through the windshield, rear window, and all side windows at all times.

Make sure the objects do not interfere with his access to the controls or hinder using them.

Stop periodically to make sure that objects extending through the back of the car are restrained properly.

A warning device, such as a red flag, should be displayed on objects that extend through the back of the car.

Loads on Top of Car

When hauling loads on top of the car, the driver should:

Check the load frequently to see that it is properly restrained and secure.

In a strong steady or gusty wind, reduce his speed and prepare to effect steering corrections in anticipation of a change in the car's handling characteristics.

The student should know the skills required for driving with a heavy load inside or on top of the car.

The driver must be able to detect changes in the car's responsiveness and performance as the result of a load on top, and to respond quickly with compensatory adjustments in his driving.

LEARNING PROBLEMS

The student should know the difficulties that may be experienced in learning to drive with a load on top of or within the car.

Maintaining Lane Position on Windy Days

When hauling a load on the car roof on windy days, the beginning driver may oversteer in his attempts to maintain position in the driving lane. The driver should be instructed to grasp the upper half of the steering wheel with both hands and to reduce his speed.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	–	–

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, p. 28.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 61.0 - 61.2.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 206-207.

On-Road Malfunctions and Breakdowns

The student should know the importance of dealing with on-road malfunctions and breakdowns.

Immediate response to a suspected malfunction may prevent a more serious breakdown later. When a breakdown does occur, the car often can be driven or pushed off the roadway where it will not interfere with the flow of traffic. When the car is stalled on the roadway and cannot be moved the driver must respond quickly to protect himself and other highway users.

DRIVING TASK REQUIREMENTS

The student should know the procedures, hazards, and laws that pertain to on-road malfunctions and breakdowns.

Parking a Disabled Car

If the car malfunctions while on the roadway, the driver should

Follow the normal procedures for leaving the roadway.

Pull off the roadway onto the shoulder or median, whichever is safer.

Park the car well off the roadway and activate the four-way flasher.

Moving a Car Stopped on Roadway

If a disabled car stops on the roadway, the driver should

Activate the four-way flasher or directional signal on the roadway side of the car.

Coast off the roadway in manual shift car by shifting to neutral and depressing the clutch, or by shifting to low or reverse, releasing the clutch, and activating the starter switch.

Using the starter switch to move the car is hard on the starter motor and will drain the battery. The procedure should be utilized to move the car only a few feet in an emergency.

As alternatives, ask the driver following to push the car off the roadway with his vehicle, if the procedure presents no hazards; or have passengers help push the car off the roadway if visibility and traffic conditions are favorable.

When a disabled car cannot be moved off the roadway, the driver should

Activate the four-way flasher.

Place flares at least 100 feet behind the car in the lane and along adjacent lanes. At night flares should be 200 to 300 yards behind the car.

It is important to position himself or a passenger behind the car to warn other traffic, if no warning devices are available, and wait for assistance.

Waiting outside the car and off the roadway is safer than sitting inside the car, even with warning devices in place.

Signal for assistance by tying a white cloth to the door handle adjacent to the roadway or the radio antenna and by raising the hood or trunk lid.

Changing a Tire

If it becomes necessary to change a tire, the driver should

Position the car well off the roadway and place the gearshift lever in park in an automatic shift car, in reverse in a manual shift car.

Turn off the ignition, set the parking brake, and remove the tire and tire-changing equipment.

Block the wheels and pry off the hub cap.

Loosen the wheel bolts slightly with the wrench provided.

Secure the jack in a straight, stable position and use it to raise the wheel off the ground.

Remove the wheel nuts and pull off the wheel.

Install the spare tire and replace the wheel nuts by hand, tightening two of the nuts (on opposite sides of wheel) firmly to position wheel correctly.

Lower the car with the jack and tighten all the nuts with the lug wrench.

Replace the hub cap.

Place the flat tire and tire-changing equipment in the trunk.

Overheated Engine

The temperature gauge on the display panel will tell the driver when the engine overheats. If this malfunction occurs, the driver should

Pull completely off the roadway.

Remove the radiator cap with a heavy cloth, add water or coolant, and place the cap back on the radiator after waiting for the engine to cool.

Radiator caps must be removed with care even when the engine is cool because the coolant in the radiator may be under considerable pressure. Steam and hot water may spew from the radiator opening and burn the driver if the cap is removed without first releasing the pressure.

If the engine overheats excessively, the cooling system should be inspected for loose connections, wear, and leakage. If all components appear to be in sound condition, the hood should be left up to permit the engine to cool.

Drive slowly to the nearest service station if coolant is not available or if it does not remedy the overheated condition.

Battery Discharging

The generator or alternator gauge on the display panel indicates when the battery is discharging. This is normal when electrical equipment is operating and the engine is off or at idle speed. If the battery is discharging with the engine at normal operating speed, it means that the battery, voltage regulator, or generator is malfunctioning, or that the fan belt which drives the generator has broken. In any case, the car should be driven immediately to a service station to be checked by a qualified mechanic.

Loss of Oil Pressure

When the oil pressure gauge on the display panel registers a loss of oil pressure, the driver should:

Turn off the engine, shift to neutral, and steer the car off the roadway at a safe place.

Irreparable damage could result if the car is driven without enough oil.

Call for a tow truck and have a qualified mechanic check the engine.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--
Handout/pamphlet	National Safety Council	"When Your Car Stalls" fact sheet

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization,* pp. 240, 242-243.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 155-156, 220, 262-264, 267-268, 277, 332-334.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education,* pp. 70-71.

Center for Safety Education, New York University. *Man and the Motor Car,* pp. 46-49, 165-168.

Center for Safety Education, New York University. *Driver Education and Traffic Safety,* pp. 40-42, 79.

Glenn, Harold T. *Youth at the Wheel,* pp. 97-101, 325-326, 330-332.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 260, 262-263.

"If There's Trouble on a Car Trip," *Changing Times,* pp. 25-26, The Kiplinger Washington Editor's Inc., Washington, D.C. August 1964.

McKnight A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 62-6 · 62-7, 63-0 · 63-3.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives,* pp. 211-220.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), p. 92.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively,* pp. 135, 202-203, 311-312.

Pushing/Towing

The student should know the function of pushing another vehicle.

Pushing a vehicle helps get the engine started when the battery has failed. Because it is dangerous, the procedure should be undertaken only when there is no other course open and when traffic conditions and the safety of motorists require it.

DRIVING TASK REQUIREMENTS

The driver should know the procedures, hazards, and laws that pertain to pushing or towing, or being pushed or towed by another vehicle.

General

Guidelines for pushing or towing another vehicle, or being pushed or towed, include the following:

Pushing or towing is dangerous to both drivers. The driver of the first vehicle, if it has power brakes and power steering, has no power to steer or brake. The driver of the second vehicle has very restricted vision. If possible the car should be started with the use of jumper cables.

Pushing is illegal in many states. The legality should be determined before the procedure is initiated.

The bumpers of the vehicles must match in contour and height. When bumpers are not perfectly matched, bumpers will lock or damage unprotected portions of the car.

Pushing should not be attempted when the two vehicles are on different levels of the road.

Vehicles should not be pushed around corners, but should coast around corners and stop before pushing is again attempted.

Four-way flashing units should be activated when a vehicle is pushing another vehicle.

If the vehicle does not start within one-half mile, pushing should be discontinued because of possible damage to the transmission.

Towing a vehicle should be avoided since the vehicle will leap forward when it starts and strike the vehicle in front.

Manual Shift Car Being Pushed

When a manual shift car is being pushed to start the engine the driver of that car should:

Turn on the ignition, depress the clutch, release the brake, and shift to high gear. (Sometimes it is easier to start the engine in second gear.)

Signal the driver behind to drop back, then let up on the clutch pedal slowly when the car's speed reaches 15 to 20 miles per hour.

If traffic or available distance necessitates trying to start at very low speed the driver of the car being pushed should:

Signal the driver of the second vehicle to drop back before letting up the clutch and then bring the clutch up quickly to start the engine.

Depressing the clutch quickly to disconnect the engine before the slow speed is reached can kill the engine again.

Automatic Shift Car Being Pushed

When an automatic shift car is being pushed, the driver of that car should:

Turn on the ignition, place the gearshift lever in neutral and leave the brakes off.

Signal the driver of the vehicle behind to drop back when the car reaches the speed of 30 to 35 miles per hour.

Move the gearshift lever to the drive position to start the engine.

The forward movement of the car will turn the engine, which enables the engine to start.

Pushing Another Vehicle

To push another vehicle the driver of the car should:

Move the car up slowly until the bumpers just touch and begin to push gradually.

Accelerate a manual shift to the speeds indicated above for automatic shift cars.

Look for signals from the vehicle driver and react appropriately.

Towing

When longer distances are involved and the vehicle cannot be driven, it should be towed rather than pushed. A tow truck should be used. Automatic transmission cars should not be towed more than 12 miles unless special mechanical precautions are taken to avoid damage to the rear wheels, drive shaft, and transmission. Automatic transmission cars should be towed with the rear wheels elevated.

The student should know the skills required for pushing another vehicle.

The driver who is pushing a vehicle with his car must be able to exercise precise speed control to maintain bumper-to-bumper contact.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--

RESOURCE MATERIALS

The student should know the basic texts, periodicals and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 400-402.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 65-0 - 65-3.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 222-223.

SUPPLEMENTARY REFERENCES

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, p. 327.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, p. 206.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 313-314.

Strasser, Marland K., Eales, John R., and Zaun, Cecil G., and Mushlitz, M. Eugene. *When You Take the Wheel*, pp. 244-245.

III-C

Emergency Procedures

The sudden emergence of a driving hazard requires a quick response on the part of the driver. From an instructional viewpoint, emergency procedures represent a substantially different problem from that of driving procedures because of (1) the need for a highly practiced, rapid, essentially "automatic" response, and (2) the element of potential danger which makes it difficult to provide necessary needed practice.

Driving emergencies may arise from hazardous conditions with respect to the following:

Car—including failures to brakes, tires, power steering, headlights.
Roadway—including potholes, obstacles.
Car Roadway—including skidding.
Traffic—including impending collision from headon, side, rear.

The following procedures are found in this section:

Skid Control
Anticipating Traffic Emergencies
Reacting to Traffic Emergencies
Car Emergencies
Post-Accident Responsibilities

Skid Control

The student should be able to detect and recover from a skid quickly enough to avoid losing directional control.

Skidding results from changes in speed or direction that are too abrupt for road surface conditions. Adherence to procedures described in earlier sections will generally prevent skids. The emphasis in instruction should be upon skid prevention. However, ability to control skidding, particularly during evasive maneuvers, will contribute greatly to reducing the likelihood and severity of collisions. The most critical elements in skid control involve manipulation of the brake so as to avoid locking the wheels, and precise steering control so as to avoid "overshooting" the desired path and compounding the skid.

DRIVING TASK REQUIREMENTS

The student should know the procedures involved in controlling a skid.

The best way to control a skid is to avoid the conditions that produce it. A skid generally occurs when changes in speed or direction are too abrupt for road surface conditions. These changes may be divided into two categories: (1) Excessive changes under normal surface conditions, such as sudden braking or sudden turning (evasive maneuvers) or a turn at excessive speed (entering a curve too rapidly); (2) normal changes on unusually slippery surfaces, such as attempting to stop or turn too abruptly on an icy or wet roadway.

In one study conducted in the State of Virginia, it was noted that 40 percent of all accidents reported during one year involved skidding; in one-third of the cases the skidding occurred prior to brake application.

Once a car has begun to skid, the driver should attempt to arrest the skid. In doing so, he should:

Turn the wheels in the direction of the desired path if the car is skidding sideways.

Remove the foot gradually from the accelerator and avoid using the brake.

> Any abrupt deceleration or brake application will tend to accentuate the skid. If the brakes are fully applied, the front wheels will lock causing a loss of steering control.

As the car approaches the desired path, turn the wheels slightly in the opposite direction to reduce the rate at which the car is rotating. Failure to "countersteer" in this manner will cause the car to rotate beyond the desired path, often to a degree that exceeds the initial skid.

> Failure to countersteer, resulting in "overshooting," contributes to a significant number of skidding accidents.

Make additional steering corrections as necessary to get the car pointed in the desired direction.

Only if or when the car is headed in the desired direction should an attempt be made to reduce speed. This should be achieved by a gentle pumping action of the brake.

Prolonged application of the brake will only cause the wheels to lock, resulting in a loss of both braking and steering control.

Generally speaking, the less slippery the surface, the more firmly the brakes can be applied.

The student should know the skills involved in detecting a skid and recovering from it.

The driver's ability to react appropriately to a skid depends upon his ability to (1) perceive that skidding has occurred, and (2) carry out the procedures necessary to arrest the skid.

The driver's ability to detect a skid results from normal driving experiences. A driver quickly learns to associate steering changes and brake application with proprioceptive and kinesthetic ("seat of the pants") cues of change in speed and direction. When his attempts to turn or slow the car fail to produce the appropriate bodily sensations, he recognizes immediately that he is skidding. While no unique perceptual skill must be developed, it is important to recognize that detection of a skid depends upon an expectation of motion cues and that skid control cannot be adequately taught where motion could not be provided, e.g., a fixed base simulator.

The motor coordinations involved in arresting a skid are among the most demanding of the skill requirements imposed upon drivers. These demands are created primarily by the need for (1) precise steering control in order to prevent "overshoot" and the resulting loss of control, and (2) the controlled braking required to maintain a steady path while slowing down.

In order to prevent overshoot, the driver must learn the precise point at which to introduce countersteering and the amount of countersteering that is needed to eliminate the car's rotation in one direction and not cause it to rotate in the other direction. For controlled braking, the driver must learn to feel the point at which further brake application will cause the wheels to lock. Effective skid control requires that each of these skills be developed to the point where both activities can be performed simultaneously.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard or traffic situation board	--	--
Handouts/pamphlets	Tire Industry Safety Council	"Studded Tire Safety and Maintenance Guide"
Tires with worn treads and good tread	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Controlling Skids," filmstrip, 50 frames, color, Ford Motor Company.

"Critical Maneuvers—Skids," 50 frames, color, Ford Motor Company.

"Don't Skid Yourself," 13 minutes, AEtna Life & Casualty Co.

"Six Deadly Skids," 26½ minutes, color, Modern Talking Pictures Service Inc.

"Skid Control" 14½ minutes, color, Modern Talking Pictures Service, Inc.

"Skids and Skidding," 30 minutes, Educational Television film produced by South Carolina Educational Television Center. Order from University of Nebraska.

"What About Winter Driving?" 12 minutes, color, National Safety Council.

Simulator Films

"Good Driving in Bad Weather,"* 20 minutes, color, AEtna Life & Casualty Co.

"Winterproof Your Driving,"* 16 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide materials for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System,* film section "Driving in Bad Weather," AEtna Life and Casualty Co.

Allstate Insurance Company. *Allstate Good Driver Trainer System,* film booklet "Winterproof Your Driving," Allstate Enterprises Inc.

American Automobile Association. *Practice Driving Guide for Use With Sportsmanlike Driving,* p. 29.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 84-87, 211-216.

Anderson, William G. *In-Car Instruction: Methods and Content,* pp. 261-268.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies,* p. 227.

Anderson, William G. *Teacher's Manual for Learning to Drive,* pp. 56-59.

Center for Safety Education, New York University. *Driver Education and Traffic Safety,* pp. 175-177, 228.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers,* pp. 49-51.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 18-0 - 18-2.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives,* pp. 44-45.

SUPPLEMENTARY REFERENCES

U.S. Air Force. *The Safe Driving Handbook,* p. 50.

American Automobile Association. *Sportsmanlike Driving: Teacher's Guide,* pp. 47-48.

American Automobile Association. *Teaching Driver and Traffic Safety Education,* pp. 211-213, 222-230.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education,* pp 64-67.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education,* pp. 275-280.

Center for Safety Education, New York University. *Man and the Motor Car,* p. 184.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 242, 244-247.

Johnson, Margaret L. "Skid School for Young Drivers," *Traffic Safety,* pp. 12-13, vol 70 no 10, October 1970.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), p. 69.

Overend, Robert B. "The Great Studded Tire Controversy," *Traffic Safety,* pp. 8-10, 35-39, vol 71 no 12, December 1971.

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*Althouth total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

SUPPLEMENTARY REFERENCES (Continued)

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 163-164

Strasser, Marland K., Eales, John R., and Aaron, James E. ***Driver Education: Learning to Drive Defensively***, pp. 304-306.

"The Science of Skid Control," ***The Air Force Driver***, pp. 2-6 and 29, March 1971.

"Teach Skidding 'Know-How' at Liberty School," ***Traffic Safety***, pp. 26, 27, 39, 40, vol 64 no 11, November 1964.

Whitworth, Richard. "Teachers Learn to Skid," ***Traffic Safety***, pp. 9, 10, 37, 38, vol 69 no 6, June 1969.

Anticipating Traffic Emergencies

The driver should observe other vehicles and be able to identify and react to potential traffic emergencies before they arise.

A great share of the accidents caused by "the other driver" could have been avoided had the victim been alert to traffic around him and been prepared to react quickly and appropriately to indications of potential hazards. Drivers should make frequent observation of oncoming vehicles and vehicles that are adjacent, following, or passing, as well as of other road users, such as pedestrians and cyclists. This awareness of others constitutes the heart of defensive driving.

DRIVING TASK REQUIREMENTS

Being Followed

The most recent edition of Accident Facts reports that nearly one-fourth of all accidents and almost five percent of fatal accidents were rear end collisions. The driver should be constantly aware of the vehicles behind and should drive cautiously when being followed. In doing so the driver should

Maintain constant speed.

Glance at the rearview mirror frequently to note whether traffic to the rear is overtaking, tailgating, moving erratically and/or signaling intentions to change lanes in preparation for passing.

Signal following traffic of his intentions to change lanes, reduce speed or stop, using directional and/or arm signals and brake lights.

> Signaling too early confuses the driver of the vehicle behind.
>
> Signaling too late gives the driver of the vehicle behind too little time to respond to the maneuver of the car.

Adjust the rearview mirror to the night position or avoid looking at the rearview mirror if being followed by a vehicle with high beams on.

Reduce speed to encourage a following vehicle with high beams on to pass.

Vehicles in Adjacent Lanes

The driver should observe vehicles in adjacent lanes for indications of a lateral movement into the driving lane. Such indications include the following:

An incipient movement by the vehicle in the direction of the driver's car.

A blockage ahead in the vehicle's lane—e.g., slowing traffic, or an accident.

A third vehicle merging into the other vehicle's lane, possibly forcing the vehicle toward the driver.

Being Passed

The driver should take an active role when being passed, continuously assessing the procedure to ensure its safe completion within the distance available and making adjustments in the car's speed and path to accommodate the passing vehicle. In taking an active role the driver should:

Use the mirrors and his peripheral vision to detect overtaking and passing vehicles.

Maintain or reduce speed, and position the car in the center of the lane or slightly to the right if necessary.

Lift his foot from accelerator and be prepared to brake to provide a larger space for a passing vehicle that might cut in front of the car.

Accelerate if the pass is aborted to allow the other vehicle additional room to move back into the driving lane.

Leave the roadway to the right if necessary, to avoid causing a head-on collision.

Meeting Oncoming Vehicles

According to Accident Facts, 16,000,000 accidents occurred in a recent year, 700,000 of which were head-on collisions and were responsible for 7,450 fatalities.

Many factors may cause an oncoming vehicle to cross the center line into the car's path—poor visibility, swerving to miss a pedestrian or cyclist, road defects or obstructions, poor judgment in speed and positioning of the vehicle, steering failure, falling asleep, and alcohol and drugs. In attempting to adjust his course when meeting oncoming vehicles, the driver should:

Align the car properly in the best available lane to allow maximum separation between the car and oncoming vehicles.

Watch for situations and driver behavior that indicate oncoming vehicles may cross the center line—e.g., vehicle weaving or the presence of slow-moving vehicles.

Observe roadway conditions and obstructions that could adversely affect the control of oncoming vehicles—e.g., the presence of pedestrians, animals, debris, and the like.

Maintain precise control over the car, ready to react quickly to wind gusts, road irregularities, and oncoming vehicles crossing the center line, especially on grades and curves where an oncoming vehicle might be attempting an unsafe pass.

Pedestrians, Cyclists, and Animals

Of the 54,800 motor vehicle fatalities in a recent year, almost 20 percent, or 10,400, were pedestrians. About two-thirds of these accidents occurred in urban areas. More than 800 bicyclists were killed in accidents with motor vehicles, these fatalities being about evenly distributed between urban and rural areas. Analysis shows that many of these accidents occurred because the pedestrians were non-drivers and lacked experience with driving problems and traffic regulations. Although accidents involving motor vehicles and animals are far less frequent than the above, the same precautions should be taken by the driver when in areas where animals are present.

When encountering pedestrians, cyclists, or animals the driver should:

Be familiar with local traffic regulations dealing with motor vehicle/bicycle/pedestrian right-of-way.

In some states pedestrians are not allowed to cross in mid-block. However, the driver should not presume right-of-way but should yeild to the pedestrian unless signaled to proceed.

Yield to pedestrians at intersections, being particularly alert for those who have anticipated a traffic signal and stepped into the roadway before a light change or who have stepped into the roadway after a light change has made crossing unsafe.

Slow down, move to the left of the driving lane and be prepared for a quick stop when encountering pedestrians, cyclists, or animals.

Slow down and be prepared to stop quickly when in the vicinity of children playing.

Observe traffic signs that indicate pedestrian, school or animal crossings, and slow down or stop if necessary.

Delay passing another vehicle until both the car and the other vehicle have safely passed pedestrians or cyclists in the roadway.

Drive slowly through puddles to avoid splashing pedestrians.

The student should develop certain perceptual skills in order to be able to anticipate possible traffic emergencies.

Development of following perceptual skills will help the driver to anticipate traffic emergencies

The ability to perceive time/distance relationship involving the car and other vehicles.

The ability to detect subtle cues from potential motions of other vehicles and pedestrians.

LEARNING PROBLEMS

The student should know the kinds of difficulties that may be experienced in learning to cope with traffic.

Beginning drivers tend to

Slow down when approaching oncoming traffic.

Steer to the right when oncoming vehicles are approaching.

Jam on the brakes if someone or something crosses the path of the car.

Freeze at the wheel and fail to react if someone or something darts in front of the car.

Slow down, hesitate and then speed up when approached from the side.

Unnecessarily Reducing Speed

A beginning driver encountering fast-moving oncoming traffic may become apprehensive and release pressure on the accelerator pedal, concentrating all of his attention on steering. This tendency may not be easily overcome since its cause is fear. As the driver becomes more confident of his ability to maintain position in the driving lane at relatively high speeds, the problem should disappear. The instructor should encourage the student driver to maintain speed when meeting oncoming vehicles if he is certain that the student's steering skills at relatively high speeds are at a high performance level.

Unnecessarily Adjusting Car's Position

A student driver may be inclined to steer to the right when oncoming vehicles are approaching. If the student is driving at high speeds this can be dangerous especially if one or two wheels drop off the pavement onto the shoulder. A verbal reminder from the instructor should be given when the driver unnecessarily moves toward the right side of the roadway. The instructor should differentiate between situations that require moving slightly to the right, as when an unusually wide vehicle is approaching, and situations in which the student driver is moving to the right because of fear. The side rearview mirror should be checked to see that it is properly adjusted and the student should be encouraged to use peripheral vision and quick head glances.

Brake Control and Evasive Steering When Encountering Pedestrians/Animals

A beginning driver is likely to jam on the brakes when encountering pedestrians, animals, or cyclists in the car's path. Coaching the student to pump the brake to stop the car or to steer rather than brake should be given.

In addition, the student driver may freeze at the wheel if a pedestrian, cyclist, or some animal suddenly darts into the path of the car. He may know what to do, but he does not react correctly or fast enough.

With more experience on the roadway, the driver should become more proficient in responding to pedestrians, animals, and cyclists. The instructor should be prepared to gain control of the car in the event the student driver freezes at the wheel or otherwise responds inappropriately.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--
Charts and/or tables on accidents involving pedestrians, animals and/or cyclists	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Pedestrians and Cyclists," No. 22, Driver Education Series, 30 minutes, b/w, Indiana University.

"Pedestrians," 10 minutes, b/w, Ford Motor Company.

"The Art of Being Passed," No. 5, Defense Driving Film series, 10 minutes, b/w, Association Films, Inc.

"Passing/Being Passed,"* No. 6, Techniques of Defense Driving Series, 7-10 minutes, color, National Safety Council.

"The Car Behind," No. 3, Techniques of Defensive Driving Film Series, 10 minutes, color. National Safety Council.

"Whiplash,"* 16 minutes, color, Charles Cahill Associates, Inc.

*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Simulator Films

"The Art of Turning,"* 26 minutes, color, Allstate Enterprises.

"Complex Traffic,"* 24 minutes, color, Allstate Enterprises.

"Hazardous Situations,"* 20 minutes, color, Allstate Enterprises.

"Drive in Review,"* 27 minutes, color, Allstate Enterprises.

"Road Check,"* 20 minutes, color, AEtna Life & Casualty Co.

"Traffic Strategy,"* 16 minutes, color, AEtna Life & Casualty Co.

"Driving Emergencies,"* 16 minutes, color, AEtna Life & Casualty Co.

RESOURCE MATERIAL

BASIC REFERENCES

AEtna Life and Casualty in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System* - Film Section, "Driving Emergencies."

American Automobile Association. *Teaching Driver and Traffic Safety Education,* p. 402.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 115-116, 148-150, 166, 200-201, 409-410.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies,* pp. 183-184.

Center for Safety Education, New York University. *Driver Education and Traffic Safety,* pp. 195-196, 204-205, 221, 236-247.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 36-0 - 36-10, 36-16 - 36-18.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives,* pp. 84-86, 94-96, 98-102.

National Education Association. National Commission on Safety Education. *How Experienced Teachers Develop Good Traffic Citizens: Tips and Cues,* pp. 52-53.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), pp. 66-67.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively,* pp. 275-280.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization,* p. 153.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education,* pp. 58-60.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education,* pp. 37-39, 56-58.

Center for Safety Education, New York University. *Man and the Motor Car,* pp. 255-258, 314-331.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 94-111, 136, 140-149, 177-179, 183-187, 201, 225, 227, 233-236, 367.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), pp. 56-57.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition,* pp. 109-111, 126, 139, 141.

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Reacting to Traffic Emergencies

The student should know and be able to carry out the procedures required to avoid an impending accident resulting from unsafe behavior by other drivers or loss of control over the car.

The best way to avoid an accident is to adhere to safe driving procedures and to look out for the potentially unsafe actions of others. However, even the most conscientious driver, due to his own lapses or those of others, will encounter emergency situations created by traffic or roadway conditions. His ability to maintain control of his car and undertake evasive action will help him to reduce the likelihood and severity of an accident.

DRIVING TASK REQUIREMENTS

Oncoming Vehicles

An oncoming vehicle may enter the driver's lane for a variety of reasons. In 1970 an estimated 700,000 head-on collisions occurred, almost 7,500 of them resulting in fatalities. The driver's ability to undertake appropriate evasive action will reduce greatly his chances of severe injury or death when he encounters an oncoming vehicle in his lane.

On-Road Evasive Action

If possible, the driver should evade an oncoming vehicle without leaving the roadway. In doing so he should:

Reduce speed quickly and sound the horn and/or flash the headlights to alert oncoming traffic and traffic to the rear of the potentially hazardous situation.

Attempt an emergency stop, if space permits, when an oncoming vehicle fails to return to its lane.

Search for a space on the roadway for taking evasive action, preferably to the right of the oncoming vehicle if space is not available for an emergency stop on the roadway.

> Evasive steering has been cited repeatedly as one of the most important means of preventing accidents and of reducing the severity of unavoidable accidents. Studies have indicated that swerving to the right affords a better chance of avoiding an oncoming vehicle than swerving to the left, since the most likely evasive action of an oncoming vehicle is to turn to the left (its right).

If on-road evasive action is necessary, the driver should:

Grasp the steering wheel firmly to make steering corrections with full control.

Remove his foot from the accelerator; refrain from braking to avoid the risk of locking the wheels and losing steering control.

Sound the horn to warn other drivers or pedestrians.

Off-Road Evasive Action

If it becomes necessary to leave the roadway, the driver should:

Look for the first available and suitable place for leaving the roadway.

> If collision with some type of object appears unavoidable, the driver should quickly select some relatively yielding object such as shrubbery or a sign post rather than rigid objects, such as bridge abutment, large trees, or steel poles.

Decelerate rapidly by pumping the brakes, turn the wheels as gradually as possible after reaching a slow speed and release the brake pedal when crossing the edge of the shoulder.

Straighten the wheels gradually once off the roadway, pump the brakes until speed is down to 10 miles per hour, and then apply the brakes steadily until stopped.

Return to the roadway from a stationary position, after the precautions for entering traffic have been taken, by turning the wheels sufficiently to cross the roadway edge at a sharp angle.

Off-Road Recovery

It may occasionally be necessary to return from the shoulder to the roadway before it is possible to bring the car to a slow speed or to stop. In returning to the roadway at moderate to high speed, the driver should:

Grasp the steering wheel firmly and turn sharply toward the roadway.

> If an attempt is made to return gradually, the resistance of the pavement against the side of the tires will generally prevent the car from mounting the pavement. When the wheels are eventually turned far enough, the car will mount the pavement unexpectedly resulting in loss of control by the driver.

Prepare to turn his wheels in the opposite direction immediately upon regaining the roadway in order to avoid crossing into the adjacent lane of traffic.

This same procedure for returning to the road at moderate to high speed should be followed when only the two wheels on the right side of the car leave the pavement, as may happen either through driver inattention or an attempt to evade a collision.

Accident surveys have revealed that a significant number of highway accidents are due to a failure to control the car properly when attempting to return to the roadway at highway speed.

Overtaking Vehicle

If the driver has been forced to slow down or stop abruptly, he may find that a vehicle from behind is unable to stop. In this event, the driver should, if at all possible, pull off the roadway to let the overtaking vehicle pass.

If a collision appears inevitable, the driver should:

Warn the passengers of the impending crash.

Remove his foot from the brake pedal.

Lower his body to the right so that his head and neck will be supported by the seat back.

Adjacent Vehicle

If a vehicle traveling or passing in an adjacent lane pulls into the driver's lane, the driver should pull off the roadway if possible, employing the evasive procedures described in connection with oncoming vehicles.

Vehicles From the Side

In 1970, nearly 2.5 million collisions occurred from the side, resulting in almost 5,000 fatalities. Most collisions from the side occur at intersections.

The best way to avoid a collision from the side is to look for entering vehicles or cross traffic wherever the roadway being traveled intersects with another roadway such as intersections, on-ramps, or merge points. This should be done regardless of which driver is required to yield the right-of-way.

It may happen that a driver suddenly observes another vehicle approaching from the side on a collision course. The driver's alternative course of action in evading a collision may be divided into three categories: slow/stop; accelerate; turn. Slowing or stopping, if it will allow the approaching vehicle to pass in front, is the safest course of action and should be followed regardless of who has the right-of-way. When confronted with an impending collision, most drivers, without thinking, tend to slam on the brakes.

If the driver is too close to the path of the approaching vehicle, applying the brakes may increase his chances of a collision by causing the car to stop directly in front of the other vehicle. Many side collisions could have been avoided had the driver who was closest to the potential point of collision merely maintained speed or accelerated to get out of the way.

Where the path ahead of the driver is blocked, the only escape route may be to the side away from the approaching vehicle. While this course may not prevent a collision from occurring, it will generally lessen the impact and, hence, the severity of damage and possible injury.

Pedestrians and Cyclists

Occasionally it may become necessary to take emergency actions to avoid striking a pedestrian, animal, or cyclist. In doing so, the driver should:

Sound the horn, pump the brakes, and use evasive steering techniques rather than panic braking.

Utilize evasive steering techniques when in danger of striking an animal only if such action would not endanger the safety of human beings.

The student should know and develop the perceptual and motor skills required to select and carry out an appropriate evasive procedure.

The following skills underlie effective evasive action:

Inhibition of Braking Response. Drivers generally learn to apply the brakes at first sign of trouble. While effective in most instances, braking can lock the wheels and cause loss of steering control, making it impossible to steer away from a collision. Through practice, drivers can acquire the ability to inhibit the braking response in situations where evasive steering will be necessary.

Selection of Appropriate Evasive Action. The time that the driver has available in selecting an appropriate evasive action will, in a true emergency, be quite brief. In order to react properly, the driver must be able to recognize quickly, from the pattern of stimuli, what constitutes the best escape route. This involves the ability to make such visual discriminations as the following.

Whether a possible escape path is free of hazardous obstacles.

Whether clearances are sufficient to allow the car to pass through them.

Whether an off-roadway surface will permit steering control.

Distances as related to the car's stopping distance.

The ability to make these discriminations rapidly constitutes a high level of perceptual skill.

Steering and Braking Control. Maintaining control over the car during an evasive maneuver requires precise steering control and braking control, as well as the ability to exercise control over both of these simultaneously. This degree of coordination constitutes the highest level of motor skill required in driving.

LEARNING PROBLEMS

The student should know the types of problems that may be experienced in learning evasive procedures.

Overcoming Reluctance to Leave the Roadway

Because of the emphasis placed upon proper lane positioning and the importance of remaining on the roadway, many students are reluctant to drive onto a shoulder at moderate to high speed. If the student is truly to be expected to react properly in the case of a real emergency, this reluctance must be overcome during instruction. This means that the student must not only succeed in performing the tasks during instruction but must do so sufficiently often to gain confidence. Students evidencing a fear of leaving the roadway should be allowed to practice initially at low speeds, but should be pressed to increase speed until the maximum is attained. A greater amount of practice should be provided in an initially hesitant student, even after a successful performance, than would be required of a student who evidenced confidence from the beginning.

Improper Braking

One of the most difficult problems encountered in teaching evasive procedures is overcoming the student's tendency to apply the brake at the occurrence of an emergency, thus locking the wheels and lessening his ability to control the car. Even when "reflex" braking is overcome, a student will generally have difficulty learning to steer and apply brakes simultaneously and in a controlled fashion.

Overlearning

Since emergencies are rare occurrences, the average driver receives little practice in reacting to them. If a student is to be able to perform well when an emergency does arise, the procedures must be "overlearned" during instruction, that is, they must be practiced beyond the point where a satisfactory response occurs. The greater the period over which the additional practice is distributed, the more enduring will be the student's ability to respond. Distributing practice also reduces the student's ability to anticipate when emergency situations will arise and therefore provides more realistic practice in dealing with truly unexpected emergencies.

Maintaining Control

During behind-the-wheel instruction, a student is frequently so intent upon a particular emergency response, that he fails to attend to other necessary responses. For example, in downshifting under a simulated brake failure, the student may allow the car to wander across the center line. The student must be forced to maintain sufficient control over the car to prevent his response to one emergency from creating another emergency.

Over-Concentration on Steering

Most students tend to concentrate on steering and neglect braking. In order to overcome this problem, the instructor may begin by requiring students to avoid use of the brake entirely until evasive steering is mastered. Many instructors feel that it is best to avoid introducing simultaneous steering and braking—rather, to instruct student to apply the brakes only after an emergency is passed. With students of limited aptitude, this practice is certainly better than allowing improper brake application.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard and traffic situation board	--	--

FILMS/FILMSTRIPS/SLIDES

Simulator Films

"Crash Avoidance," color, AEtna Life & Casualty Co.

"Driving Emergencies,"* 16 minutes, color, AEtna Life & Casualty Co.

"Hazardous Situations,"* 20 minutes, color, Allstate Enterprises.

Classroom Visual Aids

"The Head-On Crash," No. 4, Techniques of Defensive Driving Series, 10 minutes, color, National Safety Council.

"Wheels off Pavement," filmstrip, 48 frames, color, Ford Motor Company.

"Whiplash,"* 16 minutes, color, Charles Cahill Associates, Inc.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

RESOURCE MATERIALS

BASIC REFERENCES

American Automobile Association. *Practice Driving Guide for Use with Sportsmanlike Driving*, p. 24.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 170-171.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies*, p. 229.

Anderson, William G. *Teacher's Manual for Learning to Drive*, pp. 56-59.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, p. 269.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 36-4, 36-8 - 36-11, 36-18 - 36-19, 46-14, 46-15.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp 84-86, 94, 98-102, 150-151.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), p. 69.

SUPPLEMENTARY REFERENCES

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, p. 53.

Halsey, Maxwell, Kaywood, Richard and Meyerhoff, Richard A. *Let's Drive Right*, pp. 256-257, 264-268.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 138, 155-158.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, p. 318.

Car Emergencies

The student should be able to respond quickly and appropriately to emergency situations created by car malfunctions.

The most critical car malfunctions are those that affect the driver's ability to see or to brake or steer.

Proper reaction by the driver to such malfunctions may prevent or minimize the possibility of an accident and may also lessen the risk of injury to the occupants of the car.

TYPES OF EMERGENCIES

The driver should know how to respond to the following car emergencies:

Accelerator pedal stuck.

Brake failure.

Headlight failure.

Steering failure.

Engine stalled while moving.

Fire.

Hood flying open.

Tire blowout.

Stuck Accelerator

In responding to a stuck accelerator, the driver should:

Immediately turn off the ignition being careful not to engage the ignition interlock which would prevent the steering wheel from being turned once the interlock became engaged.

Avoid attempting to free the accelerator while the car is in motion.

If the car is equipped with power steering and/or power brakes, be prepared to apply greater control forces to overcome increased resistance.

Shift into neutral or depress the clutch, apply the brakes, leave the roadway at the first safe opportunity, stop the car if possible, and turn off the ignition.

Brake Failure

Dual brakes in newer cars have almost eliminated the possibility of a complete loss of braking function. Partial loss of braking function will alter the brake's response. For example, loss of the front brakes (1) may cause the car to spin around when the brake pedal is depressed and (2) increases stopping distance. Loss of the rear brakes will also increase the stopping distance somewhat.

In responding to brake failure the driver should

Pump the brake pedal, use the parking brake, and downshift.

Downshifting allows engine compression to help slow the car down.

Pull the brake release (if the parking brake is applied) so that this brake does not lock.

Warn others by activating the four-way flasher and sounding the horn.

Steer onto the shoulder or, if necessary, look for objects to sideswipe in an effort to stop.

Apply increasing force on the brake pedal if power brakes fail.

Headlight Failure

In responding to headlight failure, the driver should

Reduce speed.

Depress the dimmer switch to see if these lights are active. If they are not –

Turn on parking lights or other auxiliary lights.

Maintain the car on its path while looking for a place to leave the roadway.

Steer well off the roadway and stop.

Power Steering Failure

In responding to a power steering failure, the driver should

Maintain steering control by grasping the wheel firmly with both hands and exerting additional force to steer the car.

Restart the engine if power steering has failed because of engine failure.

Stalled Engine

In response to the engine stalling while the car is in motion, the driver should

If the car is moving less than 20 miles per hour, shift to neutral and attempt to restart the car in the normal manner.

If the car has a standard transmission and is traveling over 20 miles per hour, keep the ignition on and downshift to second gear, then let the clutch out slowly to restart the engine.

If the engine fails to restart, place the gearshift lever in neutral and coast off the roadway.

If the car has automatic transmission, place the selector lever in neutral only.

Placing the gearshift lever in park while the car is in motion will damage the transmission.

Fire

In responding to a fire in the car, the driver should:

Slow down, leave the roadway as quickly as possible, and turn off the ignition.

Use a foam or carbon dioxide fire extinguisher, if available, to put out the fire.

Since gasoline, oil, and grease are flammable, attempting to put out an engine fire with water may spread the fire.

Hood Flying Open

In responding to the hood opening while the car is in motion, the driver should:

Slow down gradually.

Observe the roadway ahead by looking under the hood or through the left window.

Steer the car onto the shoulder.

Tire Blowout

Tire failure is a major cause of freeway accidents. A blowout or sudden flat tire forcefully alters the car's direction. Therefore, the driver's initial effort should be to maintain a straight course by steering firmly. Hard braking may lock the wheels and cause the loss of steering control.

In responding to a tire blowout, the driver should:

Maintain steering control.

Reduce speed, using the brake only after speed is noticeably reduced. Avoid stopping quickly to "save" the tire.

Select a safe, level place and steer completely off the roadway.

The student should know the skills required for reacting safely when a car malfunction endangers its occupants and other road users.

The driver should be able to react quickly to a blowout, avoiding the "natural" tendency to apply the brakes. He should maintain a firm grip on the steering wheel.

He should have enough practice in the procedures required for responding to car malfunctions so that he is able to perform these procedures rapidly and under conditions of psychological stress which are induced by the emergency situation.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--
Handout/pamphlet	National Safety Council	"Panic Preventer"
Blowout simulator	(Several commercial sources)	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Handling the Unexpected," 13 minutes, color, The Jam Handy Organization.

"Night Driving and Emergency Situations," No. 25, Driver Education Series, 30 minutes, b/w, Indiana University.

"Sudden Emergencies," No. 8, Driver Education Films Series, 4½ minutes, b/w, Indiana University.

"What'll You Do If. . .?" 12 minutes, b/w, National Safety Council.

Simulator Films

"Driving Emergencies,"* 16 minutes, color, AEtna Life & Casualty Co.

"Hazardous Situations," 20 minutes, color, Allstate Enterprises.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide materials for the development of lesson plans.

BASIC REFERENCES

AEtna Life and Casualty Co. in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System*, film section "Driving Emergencies," AEtna Life and Casualty Co.

Allstate Insurance Company. *Allstate Good Driver Trainer System*, film booklet "Hazardous Situations," Allstate Enterprises.

American Automobile Association. *Practice Driving Guide for Use With Sportsmanlike Driving*, p. 24.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 171-172, 280, 333.

Anderson William G. *Learning to Drive: Skills, Concepts, and Strategies*, pp. 228-229.

Anderson, William G. *Teacher's Manual for Learning to Drive*, pp. 56-59.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 225-230.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers*, pp. 49-53.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 62-0 - 62-5.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 208-210.

SUPPLEMENTARY REFERENCES

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, pp. 62-63, 68-71.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, pp. 269-283.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 48, 307-311.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 227, 258-263.

"If There's Trouble on a Car Trip," *Changing Times*, pp. 26, 28-29, August 1964.

Kraus, Jack. "Blowouts Without Danger," *Traffic Safety*, vol 69 no 8, pp. 16-17, 34-36, August 1969.

North American Professional Driver Education Association, *The New Driver's Guide* (Strasser/Aaron), p. 68.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 168-169.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 310-313.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Post-Accident Responsibilities

The student should know and accept his post-accident responsibilities.

It is essential for the driver to know that failure to stop in the event of an accident is a serious violation of the law. In addition, he should be aware of the legal requirements he must observe and of other steps he should take in order to minimize hazards to other roadway users and to assist injured persons.

DRIVER REQUIREMENTS

The student should know what his legal obligations and other responsibilities are when a car accident occurs.

Legal Obligations Following an Accident

The driver is required by law to follow certain procedures if he is involved in an accident. Penalties for disregarding or disobeying the laws may vary from state to state. Legal responsibilities of a driver involved in an accident include:

- Stopping at the scene of the accident.
    - The car should be stopped so that it will not impede traffic.
    - If a driver fails to stop he may, upon conviction, be imprisoned and/or fined, in addition to having his driving privileges revoked.
- Summoning police if there are injuries or if property damage appears to exceed the minimum reporting level as specified by local law.
    - The minimum reporting level may vary among states. Before leaving a minor accident the driver should ascertain the requirements of local law.
- Exchanging accident information with involved parties and supplying information to the police.
    - Any driver involved in an accident must give his name, address, vehicle registration, and must give any assistance required. Failure to do so may result in fine, imprisonment, and/or revocation of driving privileges.

Other Obligations Following an Accident

In addition to his legal obligations the driver should conduct himself in the manner of a responsible citizen. These responsibilities include:

- Warning other traffic by placing flares or warning lights 200-300 yards back on the roadway.
- Applying first aid to the injured.

Assistance should be offered to the injured person if he is conscious and should be given only with his permission. If the injured person is unconscious, first aid should be performed to the best of the driver's knowledge and ability with the materials available. If assistance is refused, the driver cannot administer to the injured person without placing himself in a precarious legal position.

Summoning emergency vehicles if necessary.

For his own protection, the driver should also:

Obtain, if possible, names, addresses and statements from any witnesses who may have seen the accident.

Notify his insurance company as soon as possible.

Accidents Involving the Driver Education Car

The same post-accident responsibilities and reporting procedures must be followed when the driver education car is one of the cars involved in an accident. The instructor is responsible for assuming the post-accident responsibilities and for reporting the accident. In addition, the instructor should:

Notify the appropriate school official(s) of the accident and report any injuries.

The school authorities will notify the student driver's parents if the student is injured.

Submit a report to the school as soon as possible.

Inform the car dealer if the accident involved a car that is loaned, leased, or rented.

Abide by any other accident reporting procedures specified by the state, school policy, or dealer contract.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction and their sources.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	–	–
Handouts/pamphlets	American Red Cross 18th between D & E Sts. N.W. Washington, D.C. 20006	"Basic First Aid - Automobile Accidents" wallet card
	National Safety Council	"Your Responsibility in Auto Accidents" fact sheet
Sample accident report forms	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Accident Behavior," 20 minutes, b/w, Progressive Pictures.

"In Case of Accident," No. 3, Expert Driving Series, 10 minutes, b/w, National Safety Council.

"In Case of Accident," filmstrip, 61 frames, b/w, General Motors Corporation.

"Report That Accident," 10 minutes, color, American Mutual Insurance Alliance.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide materials for the development of lesson plans.

BASIC REFERENCES

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 118-121, 314.

Center for Safety Education, New York University. *Driver Education and Traffic Safety,* pp. 323-325.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers,* pp. 54-55.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 92-0 - 92-5.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives,* pp. 260-261.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization,* pp. 150-151.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education,* pp. 81-84.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education,* pp. 227-228.

Center for Safety Education, New York University. *Man and the Motor Car,* pp. 229-231, 234-237.

Glenn, Harold T. *Youth at the Wheel,* pp. 302-308.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right,* pp. 351-353.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), p. 91.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition,* pp. 9-11.

III-D

System Maintenance

Not all of the tasks required for safe and effective driving involve actual operation of the automobile. Drivers must also undertake a variety of activities to assure that the various components of the highway transportation system are maintained in such condition as to permit safe and effective transportation. System maintenance tasks will be described in terms of the:

Driver—and the situations influencing his ability to operate a car effectively—e.g alcohol, drugs.

Car—and the factors influencing its operation, e.g., maintenance, malfunctions.

Highway Transportation System—and the factors influencing the system's ability to support safe and effective operation of the automobile, e.g., law enforcement, driver certification.

III-D-1

Driver

Trip Planning
Alcohol and Drugs
Physical/Emotional Conditions

Trip Planning

The student should know the importance of planning and preparing for a long trip.

An estimated 84 per cent of all vacation travel is done by car. Time and effort can be saved and potential hazards reduced if the trip is well planned, routes selected and marked on state or strip maps, overnight stops planned, the car well equipped and in roadworthy condition.

The student should know the factors involved in planning a trip.

When planning a trip, the driver should (1) equip the car for emergencies, (2) make sure the car is in good repair, (3) make sure he is in good physical condition for driving, (4) chart the best route, and (5) determine the best time to travel.

Equipping the Car for Emergencies

The following items should be carried in the car at all times: jack, lug wrench, wheel blocks, flashlight, first-aid kit, flares, tool kit (screwdriver and wrench, at minimum), jumper cables, fire extinguisher, spare fuses, spare flashlight batteries and bulb, towel, rags, or paper towels, and pencil and notebook.

The following items should be added for winter driving in northern regions: scraper, snow chains, shovel, can of de-icing spray, bag of cinders or sand, and blanket, burlap bags, or carpet piece.

A jug of water, extra motor oil, and permanent antifreeze, a tire gauge and a spare fan belt should be carried on long trips.

Ensuring that Car and Driver Are in Good Condition

When preparing for a long trip the driver should make sure that the car is in good condition, paying particular attention to parts more likely to fail under heavy loads such as hoses, belts, tires, and the cooling system. The driver himself should be well rested before beginning a long day of driving.

Charting the Best Route/Map Reading

If the driver selects his route carefully, he should have minimal navigational difficulties. When preparing for a long trip over unfamiliar territory the driver should know the following:

Where to obtain up-to-date maps.

Automobile clubs, service stations, chambers of commerce, highway departments, and insurance companies are good sources of up-to-date maps.

How to read maps.

He should be familiar with the legend to be able to interpret the symbols and markings on the map. The compass card and mileage scale provide the directional orientation and perspective of the area represented on the map.

A map covering both the departure point and the destination provides a view of the distance to be traveled and an idea of the major routes and types of highways available—for example, Interstate, U.S. or state routes, and highways that have controlled access. The backs of large area maps frequently have charts or tables that provide total mileage and travel time between key points.

Regional and state maps covering smaller areas represent the routes in greater detail. The routes marked on the large map should be identified on these more detailed maps and studied to select the route that best meets the driver's needs. The selected route should be marked so that it is readily distinguishable from the original map lines.

The symbols of routes on maps usually are shaped like the route signs on the road. The sign shapes are distinct for the various types of highway.

Strip maps or route cards are of special benefit to drivers traveling alone because the driver can confirm the route at a glance. Strip maps may be obtained from automobile clubs and entrance booths on most turnpikes or can be made easily.

How to use maps.

The destination should be located in the index on the back of the map. (The index also lists local communities, streets, and public and private buildings, churches, colleges, hospitals, libraries, parks, restaurants, and theaters.) Each location is coded by letter(s) and number(s) that frame the map. The letter and number of the destination represent a column and a row which intersect within a square on the map. The destination is located within the square and should be marked.

The route from the departure point to the destination should be marked with attention given to the following factors:

Thoroughfares that divide the city north-south and east-west.

The number of streets from the driving thoroughfare to the destination.

The cross streets that border the destination.

The streets to be traveled and where turns should be made. The names of streets preceding required turns should also be noted, in order to position the car in the proper lane.

The one-way streets and their direction of travel. Cities commonly make their streets one-way to expedite the flow of traffic. Adjacent parallel streets usually have traffic moving in opposite directions.

Through parallel side streets. They may be less congested and offer better travel time than the main thoroughfares.

The criteria for selecting the safest, most convenient, and most economical route. In selecting the route, the following factors should be considered:

Route length. Mileage between towns and junctions is marked in black; mileage between key points is marked in red. Mileage for the alternate routes will usually be noted in red and/or black numbers.

Highway type (e.g., Interstate, U.S., state, secondary). In contrast to the controlled access, multilane and high-speed roadways now in use, secondary routes are likely to be on narrow, two-lane, winding, poorly surfaced roads that pass through many small towns.

Roadway classification (e.g., controlled access, divided, number of lanes, paved).

Current and seasonal weather conditions and their effects on the roadway surface.

Toll roads, bridges, and tunnels. On some toll roads, the toll is collected at the exit interchange. The card given to the driver at the entrance to the road lists the cost from that interchange to each subsequent interchange. On other roads a fixed toll is collected periodically.

Location of service stations, restaurants, hotels, motels, campsites, places of interest, and scenic areas. This information can be obtained from the back of the map. While Interstate routes generally have no service stations, restaurants or hotels/motels on the road, such accommodations are available near interchanges. Rest areas and/or picnic areas are provided along sections of the roadway.

Routes through, around, or into metropolitan areas. The backs of regional and state maps have small maps of selected cities in the area with these routes represented in detail.

When the roads are covered with ice or snow, the driver should know how to plan his route along major roadways, as they are the first to be sanded or cleared. Steep hills should be avoided, by using parallel streets that may be less steep.

Knowing the entire route or a leg at a time reduces dependence on maps while driving. If there is a passenger, he should aid the driver by reading the maps, giving him directions, looking for critical junctions, and locating the final destination.

Best Time to Travel

Selecting the right time of day to travel can determine the level of comfort and the length of time the trip will require.

Generally, eight hours' driving (300 to 500 miles), with frequent rest stops, is considered enough for one day. However, getting sufficient rest before driving is more important to maintaining driver performance than restricting continuous driving. Fatigue from prolonged driving, as opposed to fatigue from lack of rest, appears to affect perceptual-motor skills negligibly.

A time cushion should be allowed for service and rest stops, possible bad weather, traffic congestion, detours, and other unexpected delays.

By starting and stopping early in the day, the driver probably will encounter less traffic, will find suitable lodging more easily (if not previously arranged), and will avoid night driving when navigation is more difficult.

Avoiding known bottlenecks, including cities, bridges, and tunnels at peak traffic hours will also save time. Week-end and holiday travel should be avoided if possible, because of the higher risk of accidents. More people are killed during the first 12 hours of a holiday than during any other 12-hour holiday period. The hours from 6:00 to 9:00 p.m. are the most dangerous. On holiday week-ends, traffic deaths are about 25% higher than on nonholiday week-ends.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--
Classroom posters of road signs or actual road signs	--	--
Handout/pamphlets	Local service stations	"Travel Tips"
	National Safety Council	"It's Travel Time" "Road Atlas/Travel Safety Guide" "Safe Trip Planner"
Maps and Strip Maps	--	--
Samples of emergency equipment to be carried in the car	--	--

RESOURCE MATERIALS

The student should know the basic texts, periodicals and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

American Automobile Association. ***Practice Driving Guide for Use With Sportsmanlike Driving,*** p. 27.

American Automobile Association. ***Teacher's Handbook for Sportsmanlike Driving,*** pp. 143-145, 172-173.

Center for Safety Education, New York University. ***Driver Education and Traffic Safety,*** pp. 206-208.

Malfetti, James L. ***A Description of the Driving Task Adaptable for a Manual for Beginning Drivers,*** p. 538.

McKnight, A. James and Adams, Bert B. ***Driver Education Task Analysis Volume I: Task Descriptions,*** pp. 23-0 - 23-2 and 71-0 - 71-7.

McKnight, A. James and Hundt, Alan G. ***Driver Education Task Analysis Volume III: Instructional Objectives,*** pp. 224-227.o

SUPPLEMENTARY REFERENCE

Aaron, James E. and Strasser, Marland K. ***Driver and Traffic Safety Education: Content, Methods and Organization,*** pp. 148-149.

American Automobile Association. ***Teaching Driver and Traffic Safety Education,*** p. 218.

Automotive Safety Foundation. ***A Resource Curriculum in Driver and Traffic Safety Education,*** pp. 117-120.

Center for Safety Education, New York University. ***Man and the Motor Car,*** pp. 271-272.

Glenn, Harold T. ***Youth at the Wheel,*** pp. 200-210.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff Richard A. ***Let's Drive Right,*** pp. 5, 170, 206-211, 218, 237.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), pp. 70-71.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition,* pp. 148-152.

Smith, Eugene B. "Map Reading Instructions Lends Vitality," ***Safety,*** vol IV no 3, pp. 10-11, May-June 1970.

Alcohol and Drugs

The students should know the impact of alcohol and drugs upon highway safety.

The consumption of alcohol before driving is believed to be responsible for more than 20,000 highway deaths and 800,000 non-fatal crashes each year. Approximately half of the drivers involved in fatal collisions have blood alcohol concentrations at a level considered sufficient to cause driving impairment.

A sharp rise in accidents among young drivers at the legal drinking age evidences the fact that the problem arises early.

The relationship between drug consumption and highway crashes is not well known partly because few people as yet combine drugs with traffic, and partly because a good test for drug consumption is lacking. Studies of drug users frequently show a greater number of accidents and considerably more violations than other drivers of the same age, sex, and driving exposure. However, this relationship may simply mean that the same factors which lead to drug use also result in poor driving.

Alcohol

The student should know the effects of alcohol on driving performance.

Alcohol is absorbed into the bloodstream through the lining of the digestive tract, carried to all parts of the body including the brain, and eventually eliminated. As the alcohol concentration in the bloodstream increases, body functions are affected. How different people are affected varies. In addition, the same person may react differently at different times. For example:

> Use of alcohol retards the driver's reflexes. His reaction time may be increased by as much as four times the normal, if he has been drinking. Muscular coordination is also impaired. These effects are critical when stopping distances and the ability to maneuver and control the car are considered. Typically, the intoxicated driver begins slowing down too late, oversteers, weaves, and varies speeds indiscriminately.
>
> Alcohol has a detrimental effect on vision. Use of alcohol reduces visual efficiency in dim light, reduces the distance at which objects can be clearly seen, and decreases contrast sensitivity. Generally, there is a decreasing ability to detect pedestrian-size objects with increasing percentages of alcohol in the blood.
>
> Alcohol tends to make a driver feel he is more perceptive and skillful than he really is. Even a small amount of alcohol (12 ounces of beer or 1 ounce of whiskey) can affect driving. Since alcohol impairs judgment before other functions or skills, its influence is difficult for the driver to detect. The exhilaration it may produce compounds the effects of lessened driving efficiency.
>
> Use of alcohol affects the emotional and behavioral makeup by weakening a person's inhibitions and heightening existing moods such as anger or elation. Reduced inhibitions can be a factor in taking greater risks while driving. Preoccupation due to a highly emotional state of mind removes concentration from the driving task to other areas.

The students should know the relationship between the amount of alcohol consumed and impairment of driving performance.

Driving impairment and accident likelihood, while they begin to increase with the first drink, rise sharply as the percent of blood alcohol climbs from between .05 percent and .10 percent. Beyond .10 percent the driver may be considered severely impaired.

The amount of alcohol the driver can consume before reaching a specified level of blood alcohol depends on his weight, his rate of consumption, the amount of food in his stomach, and other factors. For example, a number of one-ounce drinks (or 12-ounce beers) that an individual may normally drink in one hour before reaching the .10 percent level varies from four drinks for a 130-pound person to seven drinks for a 230-pound person.

The longer the period of time over which a given quantity of alcohol is consumed, the lower will be the percent of the alcohol in the blood. Each additional hour reduces the percent 1/4 to 1/3.

The adverse affect of alcohol upon one's ability to drive has its most serious consequences among those drivers whose ability is marginal to begin with, that is, the inexperienced drivers. This means that use of alcohol is particularly dangerous among youthful, inexperienced drivers.

The student should know the law of his state as it relates to drinking and driving.

Most states have a level of .10 percent alcohol in the blood as a standard for a presumption of driving under the influence of alcohol. This limit has been recommended by the federal government. However, some states set the standard as high as .15 percent.

The penalties imposed upon a driver convicted of driving at levels above the legal limit will vary with each state. Most penalties involve a fine and suspension or revocation of license. Some states impose different penalties depending upon the level of blood alcohol.

The tests used to measure the amount of alcohol in the blood are through tests of breath, blood, and urine. Many states permit the driver to select the test. All tests assess the amount of alcohol in the blood stream and are not influenced by the type of drink, its aroma, and so on. Refusal to take a test in most states brings either a penalty or a presumption of guilt.

The student should know the means that may be taken to reduce the possibility of driving impairment resulting from excessive consumption of alcohol.

A driver who intends to consume more than one or two drinks should avoid driving to the place where alcohol will be consumed. Alternatives include riding with a non-drinker or public transportation.

If he intends to drive after drinking, an individual should do the following:

Consume food before and/or during the period alcohol is consumed. Food retards the absorption of alcohol into the blood.

Pace his drinking, consuming no more than one or two drinks in an hour.

Wait several hours if he has consumed too much. Once alcohol has entered the bloodstream, its elimination requires several hours. Coffee, cold showers, or activity does not help.

The student should know the means by which the incidence of alcohol-related highway crashes may be reduced.

Reduction of alcohol-related crashes requires the removal of drinking drivers from the highway. This, in turn, requires (1) improved detection of alcohol impaired drivers, (2) a higher incidence of prosecution and conviction among those arrested, (3) restriction or rehabilitation of those convicted, and (4) greater public support for alcohol countermeasure programs.

Improved Detection. Better detection of alcohol-impaired drivers may be achieved in the following ways:

Increased law enforcement during the late evening and early morning hours when most drinking and driving occurs.

Increased availability of chemical testing equipment and other aids such as TV tape (to record behavior for courtroom use).

Better training of law enforcement officers in identification of drinking drivers and use of chemical test equipment.

Prosecution/Conviction. A higher rate of prosecution and conviction may be achieved in the following ways:

Assignment of special prosecutors, trained in alcohol prosecution, to offset the effect of defense specialists.

Instruction of judges and magistrates in the magnitude of the drinking-driving problem and its impact upon safety.

The use of presentence investigations (and investigators) to identify repeat or chronic offenders.

Restriction/Rehabilitation. Convicted offenders may be kept off the highway in the following ways:

More severe penalties, including longer periods of suspension or revocation of license and improved standards for reissue of license.

Improved methods in the detection of drivers operating vehicles after suspension or revocation of licenses.

Increased use of mandatory remedial instruction programs.

Increased availability and greater use of rehabilitation facilities for problem drinkers, who are responsible for approximately half of alcohol-related highway fatalities.

Public Support. Public support should be given to the enactment of legislation and funds for the above countermeasures. Because approximately two-thirds of all drivers drink, these individuals tend to be sympathetic to offenders and do not give sufficient support to countermeasure programs. Methods of creating an awareness of the seriousness of the drinking-driving problem and creating favorable attitudes toward countermeasure programs include the following:

Public information programs involving use of mass media.

Inclusion of alcohol safety in public school programs of general safety, health, and driver education.

Organization of civic groups, legislative action groups to provide greater visibility and audibility to countermeasure activities.

Drugs

The student should know the effect of drugs upon driving performance.

While the term "drugs" connotes illegal drugs to many people, a variety of legal prescription and non-prescription drugs also have detrimental effects. Drugs that may adversely affect driving performance include the following:

Analgesics, sedatives, hypnotics, stimulants, and amphetamines in large amounts.

Use of amphetamines increases alertness and efficiency for a short period, but these temporary effects may be followed by headache, dizziness, fatigue, irritability, and a decreased ability to concentrate. Hallucinations may result in making driving particularly hazardous.

Antihistamines, sulfonamides, muscle relaxants, and antibiotics if they have previously caused drowsiness.

Even normal dosages of antihistamines can cause drowsiness. Antihistamines or repeated usages may also cause side effects such as inattention and confusion.

Tranquilizers taken during initial stages or following other medication.

Tranquilizers can cause drowsiness especially if excessive dosages are taken or if they are used repeatedly. In addition, they may cause blurred vision.

Narcotics such as morphine, cocaine and heroin.

Narcotics are the most powerful and dangerous type of drugs. They produce drowsiness and lethargy, inhibit concentration, and impair vision. They can be legally dispensed only by prescription from a physician.

Barbiturates, hallucinogens, and marijuana.

Individual reactions to barbiturates vary depending upon dosage. They may produce drowsiness, confusion, difficulty in thinking, and even inability to coordinate muscular actions.

Marijuana, also known as "grass," "pot," and so forth, has been known to cause hysteria in the early stages and sleepiness or a stuporous condition in later stages. Hallucinations may result from heavy dosages. Marijuana intoxication will distort a person's perception of time and space, making driving extremely dangerous.

LSD and other hallucinogenic drugs affect the nervous system, producing changes in mood and behavior, and distorting one's perception of reality. Sight, hearing, and time perception are affected.

A number of other drugs such as dramamine (a motion sickness remedy), penicillin and sulfanilamides may adversely affect driving ability. Dramamine may cause drowsiness, dull mental alertness, and slow a person's reaction time. Penicillin and sulfanilamides may cause violent and abnormal reactions.

A driver who is under treatment should consult his physician concerning the possible effect of any drugs upon driving.

Combination of Alcohol and Drugs

The student should know the effect of drugs in combination with alcohol.

The total effect experienced by a person taking drugs in combination with alcohol is often different from the effects of the two taken individually. The intensity or magnitude of the effects is a function of the type of drug and alcohol taken, as well as the quantity of each. In addition, each individual's biological and emotional makeup plays a role in his reaction to alcohol and drugs taken separately or in combination. Studies regarding the interaction of alcohol and drugs have shown that when taken in combination they adversely affect performance on driver-related skills such as steering and tracking.

Depressant drugs, such as tranquilizers and antihistamines, taken with alcohol can produce unpredictable multiplicative effects. There is a greater chance that a person will become drowsier than if the depressant drug had been taken without alcohol.

Stimulants taken with alcohol in some cases counteract the effects of low concentrations of alcohol. Subjective feelings of increased alertness result, although they are not actually accompanied by improved motor skills. At other times, the effects of the depressant and the impairment of skill resulting from the alcohol are increased by the stimulant.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Breath-analyzer	--	--
Chalkboard	--	--
Handouts	American Automobile Assoc.	"Alcohol, Vision, and Driving"
	Allstate Insurance Company	"The Drunk Driver May Kill You"
	Country Life Insurance Co.	"Famous Last Words"
	Highway Users Federation for Safety and Mobility	"Q & A: Alcohol-Medicines-Driving" "70 Proof: Fact vs. Myth" "Alcohol and the Driving Task"
	National Safety Council	"Alcohol and Traffic Accidents" data sheet "Drinking and Driving" fact sheet "Driver's Guide to Drinking" "On the Level: What You Should Know About Alcohol and Traffic Safety"

FILMS/FILMSTRIPS/SLIDES

Alcohol

Classroom Visual Aids

"Alco Beat,"* 11 minutes, color, Charles Cahill Associates, Inc.

"Alcohol and You," (1970) 28 minutes, color, Bailey Film Associates.

"Highball Highway," 12 minutes, color, Charles Cahill Associates, Inc.

"None for the Road," 12 minutes, color, Charles Cahill Associates, Inc.

"Alcohol in the Human Body," 14 minutes, color, National Safety Council.

"Theobald Faces the Facts," 14 minutes, color, National Safety Council.

"Becky," 12½ minutes, b/w or color, Association Films, Inc.

"Drinking and Driving," 7 minutes, b/w, Association Films, Inc.

"The Bottle and the Throttle," 10 minutes, b/w or color, Sid Davis Productions.

"Driving and Drinking," 14 minutes, color, General Motors Corporation.

"Fact or Fancy," 35mm filmstrip, 13 minutes, color, National Women's Christian Temperance Union.

"It's the Brain that Counts," 20 minutes, b/w, Progressive Pictures.

*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

Alcohol (Continued)

Classroom Visual Aids

"The Silent Witness," 28 minutes, b/w, Keystone Automobile Department.

"What Time is it Now?" 20 minutes, color, State of Wisconsin, Div. of Motor Vehicles.

"The Decision Is Yours; Alcohol and Driving," Film strip and audio tape (for use in conjunction with the ADTSEA curriculum noted under Basic References), National Audiovisual Center.

"Time for Decision" (1969), 29 minutes, color, Hollywood Film Enterprises, Inc.

Drugs

Classroom Visual Aids

"Drivin' and Drugs," 14 minutes, Modern Talking Pictures Service, Inc.

"Narcotics–The Inside Story," 12 minutes, color, Charles Cahill Associates, Inc.

"Narcotics–Why Not," 15 minutes, b/w and color, Charles Cahill Associates, Inc.

"Post Mortem," 13 minutes, color, National Safety Council.

Alcohol and Drugs

Classroom Visual Aids

"Drinking, Drugs, and Driving," 18 minutes, color, National Safety Council.

"Drivin', Drinkin', and Drugs," 29 minutes, color, Modern Talking Pictures Service, Inc.

"Drugs, Drinking, and Driving," 13 minutes, color, Charles Cahill Associates, Inc.

"Effects of Alcohol and Drugs,"* 30 minutes, Educational television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

RESOURCE MATERIALS

The student should know the basic texts, periodicals and reports that will provide materials for the development of lesson plans.

BASIC REFERENCES

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 56-76.

American Driver and Traffic Safety Association. *Alcohol and Driving: A Curriculum for Educators*, prepared for the National Highway Traffic Safety Administration, Washington, D.C., November 1971.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 101-105.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers*, pp. 95-100.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 73-0 - 73-3.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 234-236.

National Highway Safety Bureau. *Alcohol Safety Countermeasures Program*, U.S. Government Printing Office, Washington, D.C. 1970.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 135-136.

American Automobile Association. *Teaching Driver and Traffic Safety Education*, pp. 75-90.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

SUPPLEMENTARY REFERENCES (Continued)

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, pp. 92-95, 96-98.

Berg, Raymond K. "Are We Letting the Social Drinker Off the Hook?" *Traffic Safety*, vol 71 no 1, pp. 22-23, 42, January 1971.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 113-115, 124-125.

Department of Transportation. *Alcohol and Highway Safety: A Report to the Congress From the Secretary of Transportation*, Washington, D.C., August 1968.

Gasser, Frederick J. Jr. "Who Says the Social Drinker Isn't Dangerous?" *Traffic Safety*, vol 64 no 5, pp. 18-19, 38-40, May 1964.

Glenn, Harold T. *Youth at the Wheel*, pp. 93-94, 270-273.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 279, 281, 290, 298-310, 367.

Hames, Lee N. "How to Teach Students the Facts About Drinking and Driving," *Traffic Safety*, vol 70 no 11, pp. 8-11, 36-37, November 1970.

Howard, William L. and Davis, H.H. Jr., "The Effects of Drugs on Driving Performance," prepared by the Virginia Highway Research Council under the sponsorship of the Virginia Highway Safety Division, March 1971.

Lowery, Forst. "The Case for Quickie Breath Tests," *Traffic Safety*, vol 70 no 1, pp. 12-13, 36-37, January 1970.

National Committee on Uniform Traffic Laws and Ordinances. *Uniform Vehicle Code: Rules of the Road with Statutory Annotations*, p. 512.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 42-47.

Richards, William T. "The Number One Traffic Problem: Alcohol," *Journal of Traffic Safety Education*, vol xviii no 2, ppl 17-18, January 1971.

Stewart, Ernest I. and Malfetti, James L. *Rehabilitation of the Drunken Driver: A Corrective Course in Phoenix, Arizona, for Persons Convicted of Driving Under the Influence of Alcohol*, Teachers College Press, New York, 1970.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 65-76.

Voas, Robert B., "Alcohol in Relation to Highway Safety," *Journal of Traffic Safety Education*, vol xviii no 2, pp. 13-15, January 1971.

Waller, Julian A. "Drugs and Driving - What's the Problem?" *Concepts/For Traffic Safety*, vol 3 no 1, pp. 2-4, AEtna Life and Casualty Publication, 1969.

Waller, Julian A. "Drugs and Highway Crashes," *Traffic Digest and Review*, Traffic Institute, Northwestern University, pp. 1-6, August 1971.

Physical/Emotional Conditions

The student should know the impact of physical and emotional conditions upon driving performance.

Safe driving demands that the driver be physically and emotionally equipped to perform effectively. Licensing procedures have been generally successful in keeping off the road those who are totally unfit to drive. Because of these efforts, a relatively small number of accidents may be attributed to physical deficiencies. However, there is a variety of physical conditions that make driving potentially hazardous.

General

The driver's psychological characteristics, particularly personality factors, emotional state, and attitudes, are believed by highway safety specialists to play an extremely important role in highway safety, a more important role, in fact, than that played by the driver's knowledges and skills. The problems involved in measuring many of these psychological characteristics have made it difficult to identify just what specific characteristics are most closely associated with safe driving performance. What is known has been derived primarily from general observation rather than scientific inquiry.

Vision and Hearing

The driver should be aware of visual and auditory defects that may affect driving performance and how to compensate for such defects.

He should have his eyes and ears examined periodically and wear corrective lenses for driving.

Temporary or permanent visual and auditory ailments limit the quality and quantity of cues the driver receives. His actions may be inappropriate for a particular driving situation, not because he is ignorant of the techniques and methods of a safe efficient driver, but because of a failure to receive cues due to an impairment to his sight or hearing. The American Optometric Association estimates that at least 35 percent of all drivers have visual problems which may be dangerous, and 15 percent of these drivers are unaware of the fact.

People should not drive if they have one of the following visual defects: less than 20/70 vision (corrected), between 20/40 and 20/70 vision (corrected) at night, during bad weather, or where visibility is restricted, visual field less than 140°, eye imbalance if it produces double vision suddenly, total color blindness.

In general, the total field of vision is at a maximum between ages 16 and 35 and decreases thereafter for both sexes. By age 60 there is measurable shrinkage.

Glare resistance is best between 20 and 29 years of age, but one in seven in this group is below average. In the 30-to-39 age range, one in three is substandard. After age 50, only one in seven has normal glare resistance.

He should move his eyes continuously to the left and right to compensate for lack of good peripheral vision

The ability to perceive cues from the side is critical to accurate estimation of car velocity. The Association of Motor Vehicle Administration recommends that a driver should be able to see at least 70 degrees sideways (one eye) when looking straight ahead. A normal eye can cover 90 degrees. However, many licensed drivers lack normal peripheral vision.

Tests on accident repeaters have shown that 58% had restricted peripheral vision, and three-fourths of their accidents were sideswipes. Accident repeaters counseled about their visual problems reduced their accident rate by two-thirds while the accident rate increased nearly 50 percent among uncounseled accident repeaters.

The driver should scan the driving environment by shifting his eyes over the entire field of vision to avoid eye strain.

At least 90 percent of the cues that the driver must have to guide him in traffic are visual. The visual requirements can become demanding on long drives or in instances where there is a concentration of driving cues directly to the front, as in freeway driving. The eyes typically make short horizontal movements in the process of scanning the environment. When the driver scans the area over a prolonged period, a strain on the eye muscles generally results.

When the eyes become tired the normal amount of eye coordination is reduced. When eye fatigue occurs, there may be a reduction in depth perception. This reduction is an important factor in judging distances. With tired eyes, the field of vision is also decreased and peripheral vision is impaired.

He should listen more closely, turn the head more often, and avoid night driving if visual defects are not correctable.

He should use mirrors and peripheral vision more frequently if hearing is defective.

Frequent hearing tests are needed, particularly in later years, because a developing hearing loss is frequently not noticed by an individual.

Good hearing is needed to detect sounds of emergency situations including horns, sirens, and screeching brakes. The ability to hear these sounds may prevent an accident from occurring.

Illness

An individual who is ill or on medication should refrain from driving. Occasionally, however, he may have to drive under those conditions or he may become ill while he is driving. In following general guidelines the driver should

Determine the effects of medication from a physician and/or literature supplied with the medication before attempting to drive.

Avoid driving during periods of minor discomfort caused, for example, by nausea or cramps, if his attention to driving will be distracted.

Pull over, stop, and obtain assistance during an attack of acute pain or feeling of discomfort.

Refrain from driving when afflicted with an acute illness.

Drive only with a physician's approval when suffering from a chronic disease.

It is questionable whether people suffering from chronic diseases or impairments should drive. The type and severity of the diseases and impairments are the determinants. Accident data indicate that

Diabetics had 1.8 times as many accidents and 1.4 times the violations as normal drivers.

Epileptics had 2.0 times the accidents and 1.4 times as many violations as normal drivers.

Drivers known to have cardiovascular disease had 1.6 times as many accidents and 1.3 times as many violations as normal drivers.

People suffering from the following diseases should never drive uncontrolled diabetes, severe hyperthyroidism, acute hyper- and hypoparathyroidism, acromegaly, Simmonds' disease, Cushing's disease, Addison's disease, abnormal heart condition, hypertension, carotid sinus sensitivity leading to syncope, epilepsy with seizure history, Meniere's syndrome, severe arthritis, cerebral palsy, or later stages of muscular dystrophy.

Personality, Emotion, and Attitude

The student should know the effects of personality, emotional, and attitudinal factors upon driving performance.

The driver's personality, that is, his characteristic way of dealing with situations, will influence the manner in which he drives just as it does other aspects of his life. The effect of personality upon driving performance has been summarized in the phrase "a person drives as he lives."

Lack of good personality measures has made it difficult to associate specific characteristics with safe and unsafe performance. However, the experiences of driver educators and other highway safety specialists have led to a conclusion that unsafe driving is associated with the following personality characteristics:

Negative reaction to authority, ranging from indifference to outright rebelliousness, as evidenced by such indices as a record of offenses or lesson difficulties or conflicts with school authorities.

Impatience, a generally low tolerance for the frustrations created by traffic or highway conditions as evidenced by such behavior as driving too fast, taking chances when passing or merging, following too closely, or anticipating traffic signals.

Aggressiveness, a tendency to react to other road users as constituting a challenge, evidenced by such behavior as speeding to reach an intersection ahead of another vehicle, pulling away from stop lights too quickly, or accelerating to avoid being passed.

Impulsiveness a tendency to react too quickly, to give insufficient thought to an activity before undertaking it, as evidenced by such behavior as sudden stops, lane changes, or turns.

Anti- or asocial tendencies, a lack of responsiveness to the needs and desires of others, as evidenced by such behavior as blocking intersections or maintaining high beams in traffic.

Introversion a tendency to be overresponsive to internal stimuli, including daydreaming and preoccupation, and evidenced by frequently missed turns and failure to adapt speed to changing conditions.

While there is little that can be done to alter a driver's basic personality pattern, identification of potentially unsafe drivers allows the instructor to give them special attention and to acquaint them with potential problems.

The driver's performance is influenced by transient emotional states as well as basic personality patterns. The experiences of highway safety specialists, supported by some data from accident investigations, indicate the following emotional states to be associated with ineffective driving performance.

Anger. Drivers who are angry as a result of arguments, grievances, or other frustrations often tend to vent their feelings through operation of the car, displaying lack of courtesy and, upon occasion, overt hostility to other drivers.

Anxiety. Fear or intense worry constitutes a distraction that lessens the driver's ability to respond to changes in his driving environment.

The driver's attitudes or beliefs concerning various facets of the highway transportation system influence his willingness to undertake those activities that constitute safe driving. Among the attitudes considered by highway safety specialists to relate to driving safety are attitudes toward the following:

Risks. The driver's beliefs concerning the degree of risk associated with various situations and behaviors, including high speed, use of safety belts, passing other vehicles, use of alcohol, and car maintenance.

Traffic laws. The driver's beliefs concerning the validity of traffic laws and the need for strict law enforcement.

Other road users. The driver's beliefs as related to other road users, including the predictability of their behavior, their right to behave in certain ways, their needs, intelligence, reasons, and so on.

Responsibility. The driver's beliefs concerning his social, financial, and moral responsibilities as they relate to the car, other road users, and passengers.

The driver's attitudes appear to be the product of basic personality characteristics, interests and motives, and specific information about various facets of the highway transportation system. While the instructor can do little to influence personality and motives, he can attempt to provide and give emphasis to information that will develop positive driving attitudes, and reflect such positive attitudes in his own interaction with students.

Fatigue

The driver should know the effects of fatigue on driving safety and performance and the means of minimizing or reducing fatigue. As fatigue sets in, objects seem farther away to the driver, a distortion that creates hazardous conditions if the driver is required to stop suddenly. Perceptual skills and courtesy tend to deteriorate after several hours of continuous driving, reducing the driver's ability to perceive and react quickly to potential hazards. The driver's ability to control the car's direction and speed seems to remain constant despite fatigue. Over prolonged periods of driving, a decrease in driver attention is evidenced in a general tendency toward increased steering reversals, accelerator reversals, and speed variation.

Accident statistics show that an extremely high percentage of one-car accidents is caused by the driver falling asleep.

In combating fatigue the driver should:

Wear sunglasses on bright days and avoid looking directly into the headlights of oncoming traffic.

The eyes may become fatigued as a result of glare from the sun, shiny objects, or oncoming headlights. Sunglasses should be worn on bright days. When driving at night the driver should avoid looking at the headlights of oncoming traffic.

Maintain a cool, even temperature inside the car.

Keep at least one window open to allow fresh air to circulate and to reduce the possible inhalation of exhaust fumes entering the car through the floorboard. Certain other precautionary measures can be taken to minimize the chances of carbon monoxide poisoning—for example, when traveling in slow-moving traffic or when driving through tunnels the air intakes should be temporarily closed; or the engine should be shut off if delays are expected to be longer than a few minutes.

Change speeds about every 20 minutes.

Changing driving speed about every 15 or 20 minutes helps prevent or overcome highway hypnosis. There are three forms of highway hypnosis:

Velocitization—a condition in which the driver is unable to reckon his actual speed in terms of stopping distance.

High-speed hypnosis, a result of a trance caused by smooth and straight high speed driving, and

Hypnogogic hallucinations, a condition in which the driver performs in an erratic manner in attempting to avoid nonexistent objects.

Listen to the radio, talk, sing, drink a soft drink or coffee, and stop for a rest at least every two hours.

Talking, singing, chewing gum, eating, or drinking coffee or a soft drink (not while driving of course) aid in overcoming fatigue. In cars equipped with radios, the driver should tune in on sports and news programs or to some lively music.

Pulling to the roadside or to a rest area at least every two hours helps to offset fatigue. While stopped the driver can stretch or exercise. He can close his eyes during a rest stop to relieve eye fatigue. If available, the driver should buy coffee, tea, or soft drinks. Splashing water on the face and neck is also helpful.

The driver should, if possible, refrain from driving when fatigued. If it is necessary to drive, he should realize that his reactions are slowed, and should drive at a reduced speed, maintain greater following distance and allow for a greater stopping distance.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--
Devices for checking vision	--	--
Handouts/Pamphlets	American Medical Association	"Are You Fit to Drive?"
	Highway Users Federation for Safety and Mobility	"Q & A: Alcohol-Medicines-Driving"
	National Safety Council	"Creeping Killer-CO" fact sheet "Good Vision Protects You" fact sheet

FILMS/FILMSTRIPS/SLIDES

Physically Fit to Drive

Classroom Visual Aids

"Physical Fitness and Traffic Safety," 30 minutes, Educational television film, South Carolina Educational Television Center. Order from University of Nebraska.

Emotionally Fit to Drive/Attitudes

Classroom Visual Aids

"Attitude and Behavior or the Driver," 30 minutes, Educational television film, South Carolina Educational Television Center. Order from University of Nebraska.

"Driver Irritations," 6 minutes, b/w, National Safety Council.

"Memento," 10 minutes, color, National Safety Council.

"The Human Factor in Driving,"* 11 minutes, b/w, Progressive Pictures.

"Jerks That Irk,"* 10 minutes, color, MFA Mutual Insurance Co. & Missouri State Highway Patrol.

"Look Who's Driving," 11 minutes, b/w, AEtna Life and Casualty Company.

"Mr. Finley's Feeling," 10 minutes, b/w or color, American Bar Association.

"To See Ourselves," 14 minutes, color, b/w or color, AEtna Life and Casualty Company.

"What Made Sammy Speed," 10 minutes, b/w or color, Sid Davis Productions.

Physical and Emotional Fitness

Classroom Visual Aids

"Driver Fitness and Attitudes," 59 frames, b/w, General Motors Corp.

"The Human Factor in Driving," 11 minutes, b/w, Progressive Pictures.

RESOURCE MATERIALS

The student should know the basic texts, periodicals and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

Physically Fit to Drive

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 23-44, 49-50, 52-55, 268-270.

Center for Safety Education, New York University. *Driver Education and Traffic Safety,* pp. 92-108.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers,* pp. 92-95.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions,* pp. 22-0 - 22-3, 74-0 - 74-3.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives,* pp. 238-242.

SUPPLEMENTARY REFERENCES

Physically Fit to Drive

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization,* pp. 134-135.

American Automobile Association. *Teaching Driver and Traffic Safety Education,* pp. 91-110.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education,* pp. 106-108.

Center for Safety Education, New York University. *Man and the Motor Car,* pp. 100-117.

Glenn, Harold T. *Youth at the Wheel,* pp. 80-82, 86-93.

Haeusler, Roy. "What Everyone Should Know About Carbon Monoxide," *Traffic Safety,* vol 64, no 10, pp. 18-20, October 1964.

"If There's Trouble on a Car Trip," *Changing Times,* p. 26, August 1964.

Kerrick, John C. "Who is Fit to Drive?" *Traffic Safety,* vol 65 no 9, pp. 22-25, September 1965.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), p. 80.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively,* pp. 48-63.

"Vision and Driving," *Traffic Safety,* vol 69 no 9, pp. 8-9, 38-40, September 1969.

*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

BASIC REFERENCES

Emotionally Fit to Drive/Attitudes

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 415-416.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 109-115.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers*, pp. 100-101.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 74-2 - 74-3.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis, Volume III: Instructional Objectives*, pp. 239, 241-242.

SUPPLEMENTARY REFERENCES

Emotionally Fit to Drive/Attitudes

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 131-133.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, pp. 99-101.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 123, 128-129.

Glenn, Harold T. *Youth at the Wheel*, pp. 58-72, 265-270.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 270-297.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), pp. 81-83.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 29-32, 35-42.

III-D-2

The Car

Loading the Car
Loading and Attaching Trailers
Symptoms of Car Malfunctions
Car Maintenance

Loading the Car

The student should know the importance of properly loading the car.

In preparing for a trip by car, a driver must include a plan for loading the car which will minimize the hazards to the occupants of the car and to other drivers using the roadway.

The student should know the procedures and laws that pertain to loading objects in the passenger area.

General

In general, when loading objects in the car, the driver should limit the weight to the carrying capacity of the car and distribute the weight as uniformly as possible. In addition, he should overinflate the tires 3-5 pounds. While overinflated tires will not absorb roadway shock very well, they will permit the driver to exercise more precise steering control.

Loading Objects in the Trunk

When loading objects in the trunk the driver should:

Position and secure objects so that excessive shifting will be avoided and the trunk lid can be closed or tied down.

Position larger or protruding objects so that visibility is not obstructed, the objects clear the pavement, and do not protrude to the side or excessively behind the car.

Limit the load's extension to 6 inches to the right side of the car or to the line of the fender on the left.

Place a red cloth or red light at night on the back of an overhanging load.

Loading Objects on the Car Roof

When loading objects on the car roof the driver should:

Avoid carrying excessively heavy loads or objects which protrude over the side(s) or an excessive amount to the front or rear of the roof. Loads should not extend over 5 feet behind or in front of the roof of the car.

Check the loading rack and restraining device to be certain they are adequate for securing objects and preventing them from shifting.

Make certain vision is not obscured.

Place a red cloth or red light on overhanging loads.

Loading Objects in the Passenger Area

When loading objects in the passenger area the driver should secure them so they do not interfere with visibility or restrict the driver in any way. Loads that are not secured properly may shift if the car stops suddenly, endangering the driver and passengers or breaking the windshield.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 45, 48.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 72-0 - 72-5.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 228-230.

Loading and Attaching Trailers

The student should be aware of the importance of properly loading a trailer and of correctly securing it to the car.

As the number of trailers on the roadway has increased so has the number of accidents involving trailers. Many drivers fail to load their trailers for maximum ease and safety for towing, or to attach them properly so that traffic will be able to move smoothly and safely.

DRIVING TASK REQUIREMENTS

The student should know the procedures and laws that pertain to loading a trailer and securing it to the car.

Equipping and Attaching Trailer

In properly equipping the car and trailer and securing the trailer to the car, the driver should:

Make sure the car suspension system is adequate for hauling the extra load.

Make sure that the anticipated load dimensions and weight characteristics are within specified limitations.

Install extended rearview mirrors on both sides of the car if the trailer is wider than the car.

Install taillights, stop lights, or turn lights on the rear of the trailer if the rear car lights cannot be seen by other drivers because of the trailer width or height.

Position and secure all trailer hitches making certain that the required safety chains are properly installed and securely fastened.

Securely fasten all brake and electrical connections and check to see that the brake system and lights are working properly.

Inflate all trailer tires to the same pressure to aid in minimizing sway.

Loading the Trailer

When loading the trailer the driver should:

Distribute the weight evenly and restrain objects as necessary to prevent them from shifting and bouncing out of the trailer.

Place objects in the trailer so that they do not hang over the sides of the trailer or obscure his and other drivers' vision of the car or trailer rear lights and signals.

Attach a red flag, or red light at night, on the rear of the object(s) if they protrude from the rear.

Close or latch trailer doors or gate.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	—	—

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide materials for the development of lesson plans.

BASIC REFERENCES

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff Richard A. *Let's Drive Right*, p. 208.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 72-4, 72-6 - 72-7.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 232-233.

SUPPLEMENTARY REFERENCES

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 314-316.

"What to Know Before You Tow," *Air Force Driver*, vol 2, no 1, June 1969.

Symptoms of Car Malfunctions

The student should be able to recognize and respond to symptoms of car malfunctions, breakdowns, and deficiencies.

The driver should have some basic knowledge of how the various systems of the car function and understand the importance of remaining alert to symptoms which may indicate a deficiency or malfunction.

General

In noting any car deficiencies or malfunctions the driver should be able to relate specific symptoms associated with the following:

Steering system,
Braking system,
Suspension system and wheels,
Transmission system,
Exhaust system,
Lubrication system,
Cooling system,
Electrical system,
Engine.

Steering System

The driver should have the steering system inspected and repaired if any of the following symptoms occur:

The car wanders from side to side or drifts or pulls to the right or left. When the car wanders from side to side, the cause may be unequal tire inflation, faulty wheel alignment, faulty shock absorbers, or a broken spring.

The ease of handling a car with power steering is lost on sharp turns.

Steering becomes more difficult.

If the car steers hard it may be due to unequal or underinflated tires, inadequate lubrication, improper wheel alignment, or worn or improperly adjusted steering system parts.

The car vibrates at certain speeds, the steering wheel vibrates rapidly or shakes from side to side, or there is excessive play in the steering wheel.

Braking System

The driver should have the braking system inspected and repaired if he observes any of the following symptoms when the brakes are applied during normal driving:

The car pulls to one side. If the car pulls to one side when the brakes are applied, the brakes should be checked for damaged wheel cylinder, bent wheel, or grease on the brake lining. If all four wheels are not braking equally, the braking distance will increase and steering may be unpredictable.

The brake pedal begins to go down to the floor during sustained application.

A scraping or any other unusual sound is heard. Worn wheel bearings may cause a scraping noise as the drum rubs on the backing plate or the brake shoes drag.

Less than two inches of clearance remains between the brake pedal and the floor board.

Suspension System and Wheels

The driver should have the suspension system and the wheels of the car inspected and repaired if any of the following symptoms occur:

A clanking sound is heard as the wheels rotate.

A thumping sound is heard in the chassis as the wheels rotate. This indicates that the tires should be checked for blisters, or the wheel bearings and pinion bearings should be checked for wear and tightness. The sound may also be due to improper lubrication of the drive shaft.

The rear end of the car sways inordinately when turning corners.

The rear end bounces excessively when passing over bumps.

There is the smell of burning rubber.

Transmission System

The driver should initiate inspection and repair of the transmission system when:

The clutch pedal has too much or too little play.

A growl or rumble is heard in the higher ranges of each gear, which may be indicative of excessive wear in the transmission parts.

A car with automatic transmission hesitates or bucks during acceleration.

Exhaust System

The driver should initiate inspection and repair of the exhaust system if he notices either of the following:

The exhaust , excessively noisy or gives off a hissing sound.

Puffs of blue smoke are emitted from the system during acceleration.

Lubrication System

The driver should initiate inspection and repair of the engine lubrication system if the oil pressure gauge falls to, or remains at, the minimum position or the warning light goes on when the engine is running above idle speed.

Cooling System

The driver should initiate inspection and repair of the cooling system when the temperature gauge reaches the far right (hot) position, or the temperature warning light goes on.

Electrical System

The driver should initiate inspection and repair of the electrical system when the ammeter gauge or light shows discharge, even though all the electrical switches are turned off or the engine is running rapidly. This may indicate that the generator/alternator may be malfunctioning.

Engine

The driver should initiate inspection and repair of the engine if any of the following occur:

> The engine occasionally misses at idling or low speed or during acceleration or high speed driving. Occasional "missing" at idling or low speed may be due to an improper fuel mixture, dirty or defective spark plugs, or improper operation of the distributor and ignition timing.
>
> Any metallic tapping, whistling or other unusual noise.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--
Models or actual car parts	--	--
Vehicle Owner's Manual	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Troubleshooting Your Car," 12 minutes, b/w,
National Audiovisual Center.

RESOURCE MATERIALS

The student should know the basic texts, periodicals and reports that will provide materials for the development of lesson plans.

BASIC REFERENCES

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 279, 305-308.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 83-0 · 83-3.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 254-257.

SUPPLEMENTARY REFERENCES

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, p. 113.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 159-165, 172-175.

Glenn, Harold T. *Youth at the Wheel*, pp. 335-348.

Car Maintenance

The student should know the importance of maintaining the car in sound operating condition.

A car must be given routine care and servicing to minimize wear to its parts, to help prevent breakdowns on the roadway, to prevent failures which might cause accidents, and to improve handling qualities in case of emergencies.

DRIVER REQUIREMENTS

The student should know the procedures for maintaining the car in sound operating condition through routine care and servicing.

Introduction

The driver should maintain the car in sound operating condition through routine care and servicing, which should include attention to:

Car lights.
Tires and wheels.
Windshield, windows, and mirrors.
Cooling system.
Battery and electrical system.
Steering and suspension systems.
Braking system.
Oil level.
Drive train.
Car's interior and exterior.
Exhaust system.

Car Lights

As a part of routine care and servicing the driver should

Check all lights at least once a month for broken, cracked, or dirty lenses and inoperative bulbs; all defective parts should be replaced and dirty lenses cleaned.

Have a qualified mechanic inspect the alignment and brightness of the headlights, as recommended in the owner's manual and make the necessary adjustments.

Headlight defects are prevalent, and misalignments of even a degree or two greatly affect visibility.

Of 3,000,000 cars checked on the highways in one year, more than two-thirds had headlight defects.

Headlights aimed one to two degrees upward will reduce the normal visibility of an oncoming driver by 25 percent. Lights misaligned downward have little effect on oncoming drivers. However, headlights misaligned downward by one degree reduce the driver's visibility by 50 percent.

Tires and Wheels

Tires should be inspected at least monthly, and the driver should know how to use a gauge to check inflation pressure. The automobile manufacturer's recommended inflation pressure should be followed, to include specific adjustments for oversized tires, estimated load weights, anticipated driving speed, and the differential for front and rear wheel tires. Tires should be inflated or deflated to the proper pressure, but the pressure must not be reduced if the tire is hot.

> Underinflation shortens the life of a tire. In addition to causing excessive wear on the outside of the tread, underinflation causes flexing of the tire cords, which in turn results in excessive heat buildup and weakening of the side fabric. Steering is more difficult with underinflated tires.
>
> Overinflation may cause excessive wear in the middle of the tread and degradation of the tire's capacity for absorbing road shock.
>
> Proper tire pressure plays an important role in car performance on a curve. Cornering ability tends to improve with an increase in pressure at a constant load, due to the increase in sidewall stiffness.
>
> Worn tires are a significant factor in the degradation of car stopping capability. A bald tire skids more easily and has increased probability for blowout or punctures. A groove depth of 1/16-inch tread remaining is a minimum acceptable requirement and tires should be replaced if tread is less than that. The disablement rate rises sharply for tires with less than 1/16-inch tread remaining. Some tires possess a tread bar marking which becomes visible when the tread remaining is at the minimum acceptable limit.
>
> Excessively worn, damaged, or underinflated tires were noted in a significant number of accident reports surveyed; tire failures have been identified as the cause of a significant number of the accidents that occur under normal driving conditions.

When inspecting tires and wheels the driver should:

> Look for cuts, abrasions, and blisters on the sidewalls and tread.
>
> Have the car inspected for possible wheel damage if there are cracks at the edge of the wheel rim near the hubcap.
>
> Remove foreign material from the tread.
>
> Look for uneven wear and observe the nature of uneven wear as an indication of the need for balancing and/or wheel alignment.

Tires should be rotated every 5,000 miles to ensure even wear. The recommended method of rotation is: left front to left rear, left rear to right front, right front to right rear, right rear to spare, and spare to left front. The tires will get up to 25 percent more wear when the spare is included in the rotation scheme. Some experts denounce tire rotation entirely. They feel that good tread is so important that tires should be replaced when wear is noticeable rather than rotated for even wear.

Windshield, Windows, and Mirrors

At least once a month the driver should:

Inspect the windshield, windows, and mirrors and have damaged or defective glass or mirrors replaced.

Clean all glass surfaces and tighten and adjust mirrors.

Inspect wipers and washers, replace worn blades, remove grease from blades, and keep washer fluid in the container.

Cooling System

At least once a month the driver should check the cooling system or have it checked, with attention to the following:

The coolant level in the radiator, preferably when the engine is cold. The radiator cap should be removed slowly and cautiously with a rag until the pressure has been released, and the car manufacturer's recommended type of coolant for the season added as necessary.

The condition of radiator hoses, hose connections, and the fanbelt. Deteriorated hoses and fanbelts should be replaced, fanbelt tension should be adjusted if necessary.

The condition of the radiator. The radiator should be checked for leaks and insects. Leaves and other debris should be removed from the front of the radiator.

Battery and Electrical System

With a fully charged battery and properly functioning ignition system the engine should start quickly. Several million drivers experience roadway malfunctions each year because of battery failures. The battery power and exterior should be checked at least once a month by the driver or a service station attendant, with attention to the following items:

Electrolyte level.

Battery case and cables. Look for cracks and corrosion. Corrosion may be removed with baking soda and water solution and further corrosion prevented by coating the battery terminal posts and cables with petroleum jelly.

Clamps and cable connections. Clamps may require tightening and cables may become damaged or worn.

Battery. If it is warped, cracked, or otherwise damaged, it should be replaced.

Electrical circuits visible under the hood. Loose connections should be tightened and worn or frayed wiring should be replaced.

Steering and Suspension Systems

Proper maintenance of the steering and suspension systems is important to the accuracy of steering control and the stability of the car. For example, properly functioning shock absorbers increase cornering ability as they work with friction and gravity to combat centrifugal force. As a part of routine maintenance and servicing, the driver should:

Test the steering wheel for excessive play at least once a month and have it adjusted if it can be turned two or more inches before the front wheels begin to turn.

> Too much play in the steering wheel diminishes steering control and indicates either wear in the steering column, which can be adjusted, or worn tie rod ends. If the situation is not corrected, too much play in the steering wheel could result in failure of the steering system and complete loss of steering control.

Look monthly to see if the car lists or sags. If it does, he should have the car checked for worn or broken springs and defective or badly adjusted torsion bars.

> Defects in the suspension system can degrade the steering and stability of the car. Lowering of the front end just an inch or an inch and one-half may reduce the maximum safe speed of the car 10 or more miles per hour (e.g., 65 to 55 miles per hour) by affecting the car's stability. A reduction in the maximum safe speed and a limited steering capability would greatly affect the ability of the driver to perform evasive maneuvers.

Push down the bumper and observe the car's vertical motion at least once a month. If the car continues in a downward motion after the force has been removed, he should have the shock absorbers checked.

Have a qualified mechanic inspect the steering and suspension systems, including the steering column assembly, steering linkage, power steering unit and reservoir (if the car is so equipped), front end alignment, wheel balance, wheel bearings, springs, shock absorbers, and tires on a schedule recommended in the car owner's manual.

> Wheels frequently are found to be 6 to 12 ounces out of balance. Wheel imbalance causes a vibration which is a considerable fatigue factor, especially at higher speeds. Excessive or uneven tire wear is another result of wheel imbalance.

Braking System

A poorly maintained braking system was noted in a significant number of accident reports reviewed. As a precautionary measure the driver should have the braking system checked monthly. In doing so, he should or have a mechanic check for brake fluid leakage and add fluid to the master cylinder, if necessary.

Oil Level

Oil serves to lubricate the engine and to reduce the friction between its moving parts. Regular checks (at least once a month) when the engine is hot will minimize the possibility of the oil level dropping to a low level. If the oil level is so low the oil pump cannot circulate the oil properly, the engine can be damaged. Without adequate oil to keep the moving parts of the engine well lubricated, the parts will rub together and generate a great deal of heat. Both the friction and excess heat will cause damage to the engine very quickly. When checking the oil level the ignition should be turned off, and the dipstick removed and wiped off with a cloth, then re-inserted and removed again to observe oil level as indicated by the dipstick's markings.

When oil is to be added, a quart should be poured into the oil filler tube and the oil level should be rechecked with the dipstick. More oil should be added as required, with care taken not to overfill.

Regular oil changes every few thousand miles are necessary to remove dirty oil. Oil picks up dirt, water, acid, and other substances that lessen its lubricating effectiveness and could cause additional friction between the parts if cycled through the system.

Drive Train

The driver should check the drive train or have it checked. In doing so he should

Have the car inspected for defective seals if he finds grease leaking from the transmission or rear end assembly.

Check the automatic transmission fluid level with the engine running and add fluid if necessary and as recommended by the car manufacturer.

Check the amount of play in the clutch pedal (manual transmission). If the pedal can be pushed down more than one inch before the springs resist the pressure, he should have the clutch pedal checked and adjusted.

> Too much play in the clutch pedal (i.e., sinking to the floor quickly) may indicate that the clutch is not disengaging completely, and difficulty in shifting gears may occur. Too little play may signal a slippage and could result in excessive wear of the clutch mechanism if not corrected.

Have a qualified mechanic check the drive train, including the clutch assembly and pedal linkage in a manual transmission car, transmission, drive shaft, universal joints, differential, and rear axle as recommended in the owner's manual.

Car Interior and Exterior/Exhaust System

The driver should inspect or have someone else inspect, if necessary, the following, and should have any deficiencies corrected.

Muffler and tailpipe.

> Mufflers and tailpipes are subject to rust on both the interior and exterior walls. A worn muffler is less effective in reducing noise, and a worn tailpipe will not control the exhaust emissions as intended. Moisture from exhaust gases collects on the inside of the muffler and tailpipe and causes interior rust. This situation occurs mostly as a result of short-trip driving where the exhaust system does not get completely warmed up. Dual exhaust systems rust more quickly than single exhaust systems because they warm up more slowly. Water, snow, and salt from winter streets cause exterior rusting of the muffler and tailpipe.

Exterior trim and attachments.

> All loose attachments should be tightened, damaged equipment or accessories should be replaced or repaired, and rust spots should be touched with sealant and paint.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--
Charts, and/or tables on frequency of repair	--	--
Classroom poster	Rubber Manufacturers Assoc.	"Consumer Guide to Tire Care and Safety"
Handout/pamphlet	Rubber Manufacturers Assoc.	"Consumer Guide to Tire Care and Safety"
Vehicle Owner's Manual	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Care of the Car," 10 minutes, b/w, Ford Motor Company.

"Inspection for Vehicle Safety," 25 minutes, color, American Manufacturers Association, Inc.

"Keeping Your Car Fit," 12 minutes, b/w, National Audiovisual Center.

"Love That Car," 10 minutes, color, Charles Cahill Associates, Inc.

"The Periodic Check-Up," 18 minutes, b/w, National Audiovisual Center.

"Preventive Maintenance," filmstrip, 89 frames, b/w, General Motors Corp.

"Taking Care of Your Car," 30 minutes, Educational television film, South Carolina Educational Television Center. Order from University of Nebraska.

RESOURCE MATERIALS

The student should know the basic texts, periodicals and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 256-271, 273-291.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 70-81.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers*, pp.79-86.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 81-0 - 81-12, 82-0 - 82-6.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 244-253.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 145-146.

American Automobile Association. *Sportsmanlike Driving: Teacher's Guide*, pp. 5-6.

American Automobile Association. *Teaching Driver and Traffic Safety Education*, pp. 382-390.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, pp. 104-105.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 158-169.

Glenn, Harold T. *Youth at the Wheel*, pp. 335-348.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 218, 294, 322-335.

Harvey, Roberta (Editor). "Operating Your Car - Save as the Experts Do," *Changing Times*, pp. 1-13, The Kiplinger Washington Editors, Inc., Washington, D.C., 1966.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), pp. 86-87.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 195-206.

"These Little Mistakes Cost Car Owners Plenty," *Changing Times*, The Kiplinger Washington Editors, Inc., Washington, D.C., February 1966.

"Tire Inspection Procedures," *Traffic Safety*, vol 69, no 6, pp. 26-27, June 1969.

III-D-3

Highway Transportation System

- Traffic Laws
- Car and Driver Certification
- Auto Insurance

Traffic Laws

The student should be knowledgeable about traffic laws so that he is able to operate a car legally and safely.

Traffic laws protect pedestrians and motorists and help reduce traffic accidents and fatalities. It is important that individuals teaching driver education know the law as it relates to the operation of a car and to pass on such information to his students.

MAKING, ENFORCING, AND OBSERVING TRAFFIC LAWS

The student should know the laws that pertain to the ownership and operation of a motor vehicle and to the regulation of traffic.

Laws and Regulations for Driver to Know

The following is a list of topics related to motor vehicle operation and use about which every driver should be knowledgeable.

Vehicle registration

Acquiring an operator's permit and license

Rules of the road

Signs, signals, and roadway markings

Vehicle equipment regulations

Maintenance and service of the vehicle

Insurance and financial responsibility

Accident reporting procedures and regulations

Traffic law uniformity

Responsibility for Making Traffic Laws

The driver should be aware of the roles that all levels of government—federal, state, and local—play in making, repealing, and amending traffic laws. He should know that:

Factors influencing law-making bodies to enact new laws or to amend or nullify old laws include changes in environmental or driving conditions, determination of accident causation.

The Federal Government is responsible for enacting laws to regulate all interstate traffic.

State legislatures enact the basic traffic laws, such as maximum speed limits and right-of-way ordinances, for their respective states.

Local governments enact traffic laws applicable to their communities, such as parking and directional control of vehicles. Such laws cannot conflict with state traffic regulations.

Responsibility for Enforcing Traffic Laws

The responsibility for enforcing traffic laws is given to three agencies: police department, traffic court, and the state's motor vehicles administration. The specific traffic law enforcement duties and responsibilities of each of these agencies follow.

Police

Traffic law enforcement is normally divided among three different police forces:

Municipal Police Force.

Jurisdiction is limited to the community or municipality to which it belongs. Authority and responsibilities do not extend beyond the boundaries of the community or municipality, except in incidents of hot pursuit.

County (or Sheriff's) Police Force.

Authority is limited to county highways and to roadways in unincorporated towns and communities. It does not have responsibility for traffic control or traffic law enforcement in cities or on state or federal roadways.

State Police Force (Highway Patrol).

Jurisdiction covers state and federal roadways.

The police officer's duties specifically related to traffic law enforcement include the following:

Issuing summonses to drivers who have violated traffic regulations.

Arresting the drivers who have committed major violations such as driving while under the influence of alcohol or drugs.

Investigating, analyzing, and filing reports on traffic accidents.

Appearing in traffic court to serve as a witness against traffic violators.

In addition, a traffic officer supervises and directs traffic in areas congested by a malfunctioning traffic light or heavy traffic.

The driver educator can assist the police in improving the safety of the highway transportation system by encouraging his students to (1) observe traffic laws, and (2) support the police in their performance of traffic services. Specific activities that may be performed in this regard include the following:

Emphasizing the "service" function of the police.

The term "Police Traffic Services" implies a broader range of activities than "law enforcement" and is a truer reflection on the role played by police in the highway transportation system. The police functions identified in the preceding paragraph should be described in terms of their benefit to the prospective driver.

Attempting to overcome misconceptions concerning police operations.

> While every profession in every group has its undesirables, the overwhelming majority of police officers are honest.
>
> Police do not "fix" summonses. Where the practice exists, it takes place primarily outside of the police organization.
>
> So called "speed traps" are almost nonexistent. While police may be found at points where laws are most frequently violated, they do not entice or "bait" drivers.
>
> Police rarely benefit directly from the issuance of a traffic summons. The existence of "quotas," or provision for "kickbacks" is largely a myth.
>
> While traffic services do divert police from the apprehension of "true criminals," the responsibility for this situation lies with traffic violators, not the police.

Encouraging students to support legislation that removes police departments from political influence or dependence upon fines for revenues.

Encouraging students to give assistance to police where possible, e.g., care of the injured at an accident site.

Bringing a police representative into the classroom or a school-wide assembly in order to provide an opportunity to introduce students to the police traffic services under the most favorable possible conditions.

Traffic Court

The system for processing cases involving traffic violations varies with the size of the jurisdictional area in which the drivers are arrested. Most small communities still use justice of the peace courts, which usually hear traffic cases soon after the citations are issued and render a verdict immediately.

In metropolitan areas, however, crowded courtrooms have necessitated the establishment of "violations bureaus" as well as traffic courts to deal with the great number of cases involving driving violations. Violations bureaus handle minor charges, such as parking violations, for which standard fines can be assessed. Traffic courts handle more serious violations such as reckless driving or driving while intoxicated. Their responsibilities include:

Determining the guilt or innocence of a driver accused of a traffic violation.

Determining the penalty for the convicted driver.

> Penalties may include a fine, a suspended sentence entered on the driver's record, suspension or revocation of the license to drive, imprisonment, or some combination of these.

Attempting to retrain and reeducate the driver convicted of a traffic offense.

> As part of their penalty, convicted drivers often are required to attend a violator's school and/or complete a driver improvement course.

When a driver is thought to be "at fault" in a traffic accident, he is cited by the investigating officer on a specific charge—(for example), failure to yield the right of way. The driver's copy of the citation is a summons to appear in court at a preliminary hearing. His signature on the form is his agreement to appear on the date indicated.

At the hearing, the magistrate asks for one of two pleas: guilty or not guilty. The driver may enter either plea or state that he will accept the decision of the court without contest (nolo contendere).

A plea of guilty or *nolo contendere*, if accepted by the magistrate, is usually followed by pronouncement of sentence - generally a fine and court costs. On a plea of not guilty, the magistrate sets a trial date and may require a bond, either cash or property, to assure the driver's appearance in court. The driver may request a trial by jury.

At his trial, the driver is permitted witnesses and may plead his own case or be represented by counsel. If he is found guilty of the charge, either by the jury or by the magistrate, he is liable for all court costs in addition to the fine and/or sentence imposed by the court.

Motor Vehicle Administration

The major responsibility of a state motor vehicle administration is the testing and licensing of drivers. In addition, it has two important law enforcement functions

To act as final authority in the suspension or revocation of a driver's license to operate a motor vehicle.

To maintain traffic records so that habitual violators can be detected and appropriate action taken.

> Many states utilize the point system for recording the frequency and seriousness of driver violations. Systems may vary among states, although most operate on the principle in which a specified number of points is assigned for each type of violation. Minor violations generally carry less point values than do serious violations. Drivers who accumulate a given number of points over a specified time period may have their licenses suspended or revoked.

Observing Traffic Laws

No law is self-enforcing, but an individual becomes a better driver when he voluntarily complies with the law. He reduces his chances of being involved in an accident which can cause death, injury, and property damage.

Drivers without traffic violations or accidents on their driving records sometimes have lower insurance rates.

Traffic Signs, Signals, and Pavement Markings

Every driver must know the "rules of the road" that regulate such driving tasks as passing, turning, parking, and speed control. Rules of the road are spelled out for the driver in traffic signs, signals, and pavement markings, and it is the responsibility of every driver to be able to recognize and interpret them.

In 1970, the Federal Government approved a uniform system of traffic control devices which has been published by the Federal Highway Administration of the U.S. Department of Transportation in the "Manual of Uniform Traffic Control Devices." The new system, which should be completely set up in all 50 states by 1976, has simplified the "language" which guides drivers along the roadway. It is a language of shape and color. For example:

Almost all warning signs contain a black symbol within a yellow diamond. Exception school crossing signs, which are a drawing of two children in black against a yellow background of a one-room schoolhouse.

Signs with a bright red color now include not only "stop" but also "yield" and "do not enter."

Green with white symbols and letters indicates guidance.

Blue indicates special services, such as hospitals, picnic areas, and public telephones.

Brown signifies recreational areas, such as national parks.

Orange warns of road maintenance or construction work.

The new "warning" sign is a pennant placed on the left side of the roadway instead of on the right where, in the past, the sign has been blocked from view by large vehicles ahead.

A red light means "stop." A green light means "proceed," but with caution. An amber light means "caution."

> The driver should stop, if he can, before entering the intersection; he should remain stopped until the light changes to green if he is already stopped when the amber light is activated.

A flashing yellow light means to exercise caution before proceeding, or stopping if necessary.

A white, rectangular sign provides information on laws and regulations—for example, "no left turn."

The inverted triangle means to yield the right of way.

A red circle with a diagonal slash indicates prohibited movement.

Arrows on the pavement indicate the direction(s) that traffic in the lane may travel.

A solid line on the driver's side of the road indicates he may not pass.

A broken line on the roadway indicates passing is permitted in either direction if it is safe to do so.

A broken line on the driver's side of the roadway indicates he may pass if all conditions indicate it is safe to do so.

White symbols or writing on a blue background indicates motorist services.

White symbols or writing on a green background gives the driver direction or guidance.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--
Handouts/Pamphlets	National Safety Council	"The Point System" fact sheet "Traffic Control Devices" data sheet "Traffic Courts on Trial" fact sheet "Signs of Life: Know–Obey" fact sheet
State Driver's Manual	Department of Motor Vehicles	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

Traffic Laws and Regulations

"And Then There Were Four," 25 minutes, b/w, National Safety Council.

"Uniform Traffic Laws," 5½ minutes, color, National Safety Council.

"The Traffic Problem," 20 minutes, b/w, National Safety Council.

"Traffic Laws Made by Man," 30 minutes, Educational Television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from the University of Nebraska.

"Motor Vehicle Laws," 30 minutes, Educational Television film produced by South Carolina Educational Television Center under the auspices of the American Automobile Association. Order from University of Nebraska.

"Traffic Law Observance and Enforcement," 30 minutes, Educational Television film produced by South Carolina Educational Television Center under the auspices of the American Automotive Association. Order from University of Nebraska.

"Ticket to Safety," 10 minutes, b/w, General Motors Corporation.

"A Shade of Difference," 30 minutes, International Film Bureau, Inc.

Law Enforcement

"Corrective Penalization," 20 minutes, b/w, American Bar Association.

"Procedure in the Traffic Courtroom," 20 minutes, b/w, American Bar Association.

"A Day in the Life of a California Highway Patrolman," 15 minutes, color, Charles Cahill Associates, Inc.

"EVOC-Emergency Vehicle Operations Course," 17 minutes, color, Charles Cahill Associates, Inc.

"Flagged for Action," 30 minutes, b/w or color, National Film Board of Canada.

"The Right Point of View," 22½ minutes, color, Ontario Department of Transport.

Traffic Signs, Signals, and Roadway Markings

"Driving Signs," 39 frames, color, Long Filmslide Service.

"Information Signs," 41 frames, color, Long Filmslide Service.

"Warning Signs," 34 frames, color, Long Filmslide Service.

"Signs of Life," 11 minutes, b/w, Progressive Pictures.

"Signs, Signals, and Safety," 12 minutes, color, Louisiana Department of Highways.

"Signs, Take a Holiday," 10 minutes, b/w, Associated Films, Inc.

"The Silent Guide," 26½ minutes, color, National Safety Council.

Simulator Film

"Safe Highway Driving,"* 16 minutes, color, AEtna Life & Casualty Co.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide material for the development of lesson plans.

BASIC REFERENCES

Traffic Laws and Regulations

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 136-140.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 105-125.

Anderson, William G. *In-Car Instruction: Methods and Content*, p. 57.

Anderson, William G. *Learning to Drive: Skills, Concepts and Strategies*, pp. 88-91.

National Committee on Uniform Traffic Laws and Ordinances. *Uniform Vehicle Code and Model Traffic Ordinance.*

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 161-168, 177-178.

SUPPLEMENTARY REFERENCES

Traffic Laws and Regulations

American Automobile Association. *Teaching Driver and Traffic Safety Education*, p. 198.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, pp. 131-134.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, pp. 101-103, 138-141, 226-227.

Glenn, Harold T. *Youth at the Wheel*, pp. 162-167.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 60-76, 171-173, 196, 362-363.

North American Professional Driver Education Association. *The New Driver's Guide*, p. 85.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 5-9, 31, 116-118, 144-148, 214-215, 217.

BASIC REFERENCES

Law Enforcement

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 125-134.

American Automobile Association. *Teaching Driver and Traffic Safety Education*, pp. 321-346, 356-358.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, pp. 106-108, 111-122.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 32-33, 280-283, 287-300.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 238-245.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 191-196.

SUPPLEMENTARY REFERENCES

Law Enforcement

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 11, 138-140, 340-341.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, pp. 131-132, 134-137.

Glenn, Harold T. *Youth at the Wheel*, pp. 45-48, 275-278.

Sullivan, Harold W. "Should We Abolish Traffic Courts?" *Analogy*, pp. 27-31, Autumn, 1969.

Traffic Courts, (a section of the action program for highway safety), Report of the President's Committee for Traffic Safety, 1961.

Truax, Lyle H., "Revolutionary Changes Needed in Traffic Law Enforcement," *Traffic Safety*, vol. 70, no. 7, pp. 16-17, July 1970.

BASIC REFERENCES

Traffic Signs, Signals and Roadway Markings

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving,* pp. 143-145, 158-165.

The American Association of State Highway Officials and the National Joint Committee on Uniform Traffic Control Devices. *Manual on Uniform Traffic Control Devices for Streets and Highways,* Federal Highway Administration, U.S. Department of Transportation, 1971. Order from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, Stock Number 4001-0021.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies,* pp. 184-186.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education,* pp. 134-138.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively,* pp. 170-176.

SUPPLEMENTARY REFERENCES

Traffic Signs, Signals and Roadway Markings

Glenn, Harold T. *Youth at the Wheel,* pp. 168-171.

"The New Look in Traffic Control Devices," *Traffic Digest and Review,* vol. 19, no. 12, pp. 14-15, December 1971.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), pp. 22-23.

Shoaf, Ross T. "Traffic Control Devices Move Toward World Uniformity," *Traffic Safety,* vol. 71, no. 8, pp. 24-26, 40, 42, August 1971.

Car and Driver Certification

The student should know the importance of driver and car certification.

The law requires that cars be licensed and registered by their owners and that license plates be displayed and registration documents carried in the car at all times. In addition, the driver must obtain and carry with him a valid operator's license which certifies his right to operate a car.

Driver Certification

Before an individual can legally drive a car he must obtain a learner's permit or driver's license. A learner's permit enables him to drive only under the supervision and guidance of a licensed driver who is seated next to him.

The driver should be aware of the regulations that pertain to obtaining, maintaining, and renewing a driver's license. Specifically, he should know that:

> He can obtain a valid driver's license from the state motor vehicle department.
>
> He must carry his license with him at all times when driving.
>
> He must adhere to any restrictions on the license when driving.
>
> It is illegal to lend his driver's license to anyone.
>
> He must notify the proper state agency when there is a change of name or address.
>
> If his license is lost or stolen he must obtain a duplicate from the state licensing agency.
>
> He must apply for license renewal prior to the expiration date.

Car Certification

All states and the District of Columbia require the driver to register his car(s) with the motor vehicle department. Most of the states and the District of Columbia require that the car be in sound operating condition before it is registered.

In addition to inspection requirements the owner of a car must comply with several car certification requirements. The driver should know the following regarding car certification:

> When buying a car or moving to another state the driver must obtain a registration certificate and license plates from the state motor vehicle department. All cars driven must be registered and have license plates displayed to indicate that someone has legal custody of the car.
>
> The owner of the car must have a certificate of ownership.
>
> The car registration must be carried in the car at all times.
>
> The registration certificate must be renewed prior to expiration date.
>
> The car ownership certificate should be placed in a safe place, but not in the car.

Specific vehicle and title registration requirements exist for non-residents and servicemen. These requirements vary from state to state.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--
Sample driver's license and certificate of ownership.	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Driver's Permit or Operator's License," 30 minutes, Educational television film, South Carolina Educational Television Center. Order from University of Nebraska.

"Motor Vehicle Administration," Motor Vehicle Department Traffic Safety Division of each state.

RESOURCE MATERIALS

The student should know the basic tests, periodicals and reports that will provide materials for the development of lesson plans.

BASIC REFERENCES

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 48-49, 52-53, 121-124, 405-407.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 29-30, 278-280, 284-286.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, pp. 91-0 - 91-1.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, pp. 258-259.

State Driver's Manual, Division of Motor Vehicles.

SUPPLEMENTARY REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 110-111, 131-132, 374-375.

American Automobile Association. *Teaching Driver and Traffic Safety Education*, pp. 346-356.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, pp. 98-101, 106-108.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 228-229.

Glenn, Harold T. *Youth at the Wheel*, pp. 158-160.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 364-365.

Leslie, John D. "A Close Look at Driver Licensing," *Traffic Safety*, vol [illegible] no 5, pp. 16-18, 38-39, May 1971.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 1-5, 215.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 22-26, 100, 181, 182.

Auto Insurance

The student should be informed about auto insurance and the requirements and laws related to it.

The basic principle of insurance is to spread the risk of possible loss. An insurance policy is protection against specified losses and a fee, or premium, is paid to the insurance company for this protection.

State laws vary as to the amount and type of insurance coverage required and the student should understand that he is responsible for obtaining such coverage as required by the state in which he resides.

Types of Coverages

Automobile insurance provides financial protection to the insured in the event of injury to himself and other involved individuals, damage to or loss of his car, or claims placed against the insured as a result of the use of his car.

Two policy forms generally are available the Special Policy and the Family Policy.

The Special Policy is a package liability policy which automatically includes no-fault medical payment coverage, death benefits, and uninsured motorist coverage. Other coverages, such as collision or comprehensive, may be added. However, this policy usually excludes the payment of injuries covered by other insurance.

The policy which private passenger car owners usually carry is the Family Policy. This coverage gives protection against negligence claims to (1) the insured when driving his own car, someone else's car, or a rented car, (2) to members of his household when they drive the insured's car and, in some policies, when they drive someone else's car; and (3) to other persons who drive the insured's car with his permission.

The family policy offers the following kinds of coverages

> ***Liability Insurance.*** The various liability coverages protect the insured against financial loss by paying legal claims others may have against him. It pays judgments that a court may assess against the insured as a result of bodily injury or death and of property damage. Liability limits are usually described by a series of three numbers, for example, 100/300/25. This describes liability insurance that pays a maximum of $100,000 for bodily injury to one person; a maximum of $300,000 for all injuries in one accident; and $25,000 for property damage. Any loss above the stated limits of the policy must be borne by the insured.
>
> ***Collision Insurance,*** required by lending agencies until the car is paid for, covers damages to the insured's car in a collision or a single-car accident. It protects the insured against a large loss, such as total destruction of the car. This coverage usually has a deductible provision, such as $50 or $100 deductible, which means that the insured is responsible for the first $50 or $100 of the damages to the car, and the insurance company for the amount over the deductible provision. Full collision coverage is no longer available.
>
> ***Medical Payments Insurance*** pays the medical and hospital bills and funeral expenses of victims of car accidents, regardless of who is at fault. Coverage usually extends to the insured and anyone riding in his car as well as the insured and members of his family while riding in another car.

Uninsured Motorist Coverage provides financial protection to the insured and passengers in his car if they are injured in a car accident and the blame is attributable to an uninsured or hit and run driver.

Comprehensive Coverage, which is required by lending agencies, pays the insured for loss or damage to his car by theft, fire, lightning, vandalism, falling objects, and many other causes, except collision and upset.

Financial Responsibility/Coverage Limits/Premium Rates

Other factors pertaining to insurance which should concern the driver include:

Financial responsibility laws in the state in which the car is registered and in which the driver resides.

Limits of coverage. Some states require minimum amounts of liability insurance.

Insurance premium rates. The cost of insurance varies with geographical location and depends basically upon dollar losses paid where the driver resides, value of the car, sex of the driver, age of the car, and age of the driver.

Driver Education and Insurance Rate Reduction

Some insurance companies may subsidize, to a certain percent, individuals who apply for automobile insurance if they have successfully completed an accredited driver education course. The subsidy is usually a ten percent rate reduction on the bodily injury and property damage liability premium.

No-Fault Insurance

The current system for automobile insurance is based on the law of torts (wrongs) under which someone must be proved "at fault" before a court can award damages. With the accident rate increasing, establishing such proof has created huge backlogs in the courts. It often takes two years or longer before the court is able to hear a case. In the meantime, the victim of the accident may have accumulated large medical bills and have been unable to work. When the case is finally tried and at fault is proven, the injured person often must pay his attorney a third of the award.

In an effort to eliminate some of the problems resulting from this system, several states, including Massachusetts and Florida, have adopted a "no-fault" system, and many others are considering its adoption. With no-fault insurance, everyone involved in an auto accident is automatically reimbursed by his own insurance company for medical expenses, lost work time, and damages to his car. Victims with permanent injuries are allowed to plead their cases in court in the manner of the at-fault system.

Theoretically, the cost to the insurance companies under no-fault coverage is the same as that for at-fault, while administrative costs are drastically reduced. The significance of this should be lower car insurance premiums or, at least, a limit on yearly increases.

INSTRUCTIONAL AIDS

The student should know the instructional aids that can be secured or constructed to supplement classroom instruction.

CLASSROOM AIDS

Type	*Source*	*Title*
Chalkboard	--	--
Charts and/or tables describing coverage in terms of cost, age etc.	--	--
Pamphlets from insurance companies describing automobile insurance coverages	--	--

FILMS/FILMSTRIPS/SLIDES

Classroom Visual Aids

"Auto Insurance and You," filmstrip, 30 frames, b/w, Western Insurance Information Service.

"Buying and Insuring Your Car," 30 minutes, Educational television film, South Carolina Educational Television Center. Order from University of Nebraska.

"Liability and Insurance," No. 28, Driver Education Series, 30 minutes, b/w, Indiana University.

"Not Around the Block,"* 16 minutes, b/w or color, MFA Mutual Insurance Co. & Missouri State Highway Patrol.

RESOURCE MATERIALS

The student should know the basic texts, periodicals, and reports that will provide materials for the development of lesson plans.

BASIC REFERENCES

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods and Organization*, pp. 147-148.

American Automobile Association. *Teacher's Handbook for Sportsmanlike Driving*, pp. 124-125, 309-321.

American Automobile Association. *Teaching Driver and Traffic Safety Education*. pp. 358-359, 391-398.

Automotive Safety Foundation. *A Resource Curriculum in Driver and Traffic Safety Education*, pp. 85-89.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*. pp. 328-335.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, pp. 282-283, 313-325.

Consumer Reports Buying Guide 1973, pp. 435-437, Consumers Union of United States, Inc., 256 Washington St., Mount Vernon, N.Y., December 1972.

Strasser, Marland K., Eales, John R., Zaun, Cecil G. and Mushlitz, M. Eugene. *When You Take the Wheel*, pp. 90-91.

SUPPLEMENTARY REFERENCES

"Auto Insurance," *Air Force Driver*, pp. 18-19, December 1970.

Center for Safety Education, New York University. *Man and the Motor Car*, pp. 172, 232-234.

Glenn, Harold T. *Youth at the Wheel*, pp. 37, 308-309.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right*, pp. 344-350.

Roalman, A.R. and Buldak, Gerald E., "What's Ahead in Auto Insurance," *Traffic Safety*, Vol. 69, No. 10, pp. 8-10, 33-34, October 1969.

North American Professional Driver Education Association. *The New Driver's Guide* (Strasser/Aaron), pp. 88-90.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, pp. 11, 191-193.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, pp. 101-106.

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*Although total length of the visual aid is listed, only segments of it pertain specifically to the instructional objective.

III-E

Appendix

1. Suppliers of Instructional Aids
2. Suppliers of Resource Materials

APPENDIX E 1

Suppliers of Instructional Aids

AEtna Life and Casualty Co.
Driver Education Services
Hartford, Conn. 06115

Aims Instructional Media Services, Inc.
PO Box 1010
Hollywood, Calif. 90028

Allstate Enterprises
Driver Education Services
Allstate Plaza, F3
Northbrook, Ill. 60062

American Automobile Association
1712 G St. NW
Washington, D.C.

American Bar Association
Traffic Court Program
1155 E. 60th St.
Chicago, Ill. 60637

American Manufacturers Association, Inc.
320 New Center Bldg.
Detroit, Mich. 48202

American Medical Association
Committee on Medical Aspects of Automotive Safety
535 North Dearborn St.
Chicago, Ill. 60610

American Mutual Insurance Alliance
20 N. Wacker Drive
Chicago, Ill. 60600

American Oil Company
910 S. Michigan Ave.
Chicago, Ill. 60605

American Red Cross
18th between D & E Sts. NW
Washington, D.C. 20006

Association Films, Inc.
600 Madison Ave.
New York, N.Y. 10022

Bailey Film Associates
2711 Michigan Ave.
Santa Monica, Calif. 90404

Bureau of Safety
33rd Floor Brunswick Bldg.
69 W. Washington St.
Chicago, Ill. 60602

Charles Cahill Associates, Inc.
PO Box 3220
Hollywood, Calif. 90028

Canada Safety Council
Highway Safety Section
30 The Driveway
Ottawa, Canada, L2P-1C9

Country Life Insurance Co.
Bloomington, Ill. 61701

Walt Disney Productions
237 N. Northwest Highway
Park Ridge, Ill. 60068

Ford Motor Company
Film Library
The American Road
Dearborn, Mich. 48100

General Motors Corp.
Film Library
General Motors Bldg.
Detroit, Mich. 48200

General Services Administration
National Audiovisual Center
Washington, D.C. 20409

The Jam Handy Organization
2821 East Grand Boulevard
Detroit, Mich. 48200

Highway Users Federation for Safety and Mobility
(HUFSAM)
Auto Dealers Traffic Safety Council
Auto Industries Division
1776 Massachusetts Ave. NW
Washington, D.C. 20036

Hollywood Film Enterprises, Inc.
66 Sunset Blvd.
Los Angeles, Calif. 90028

Illinois Central Railroad Co.
135 E. 11th Place
Chicago, Ill. 60605

Indiana University
Audio-Visual Center
Bloomington, Ind. 47401

International Film Bureau, Inc.
332 S. Michigan Ave.
Chicago, Ill. 60604

Keystone Automobile Department
Traffic Safety Department
220 South Broad St.
Philadelphia, Pa. 19100

Long Filmslide Service
7507 Fairmont Ave.
El Cerrito, Calif. 94530

Louisiana Department of Highways
Public Relations and Education
PO 44245
Baton Rouge, La. 70804

McGraw Hill Book Co.
Film Division
330 West 42nd St.
New York, N.Y. 10036

MFA Mutual Insurance Co. and
Missouri State Highway Patrol
Columbia, Mo. 65201

Michigan Department of State Highways
Public Information Office
Mason Bldg.
Lansing, Mich. 48926

Modern Talking Pictures Service, Inc.
1212 Avenue of the Americas
New York, N.Y. 10030

Motion Picture Services
PO Box 701, Townley Branch
Union, N.J. 07083

National Aeronautics and Space Administration
Code FAD-S
Washington, D.C. 20546

National Film Board of Canada
680 5th Ave.
New York, N.Y. 10019

National Safety Council
425 N. Michigan Avenue
Chicago, Ill. 60600

National Women's Christian Temperance Union
1730 Chicago Ave.
Evanston, Ill. 60201

Ontario Dept. of Transport
Highway Safety Branch
Parliament Bldgs.
Queens Park, Toronto 2, Ontario

Progressive Pictures
6351 Thornhill Drive
Oakland, Calif. 94600

Rubber Manufacturers Assoc.
444 Madison Ave.
New York, N.Y. 10022

Safe Winter Driving League
635 N. Michigan Ave.
Chicago, Ill. 60611

Shell Oil Company
450 North Meridian St.
Indianapolis, Ind. 46200

Sid Davis Productions
2429 Ocean Park Blvd.
Santa Monica, Calif. 90405

Society for Visual Education, Inc.
1245 Diversey Parkway
Chicago, Ill. 60614

Southern Pacific Co.
Superintendent of Safety
65 Market St.
San Francisco, Cal. 94105

Tire Industry Safety Council
Distributor: "Tire Safety"
Box 726
New York, N.Y. 10010

United World Films
7356 Milrose Ave.
Los Angeles, Calif. 90000

University of California Extension Media Center
Educational Film Sales
Berkeley, Calif. 94720

University of Michigan
Michigan Highway Safety Research Institute
Ann Arbor, Mich. 48100

University of Nebraska
Great Plains Instructional Television Library
Lincoln, Nebr. 68500

Western Insurance Information Service
4050 Wilshire Blvd.
Los Angeles, Calif. 90005

State of Wisconsin
Division of Motor Vehicles
Hill Farms State Office Bldg.
4802 Sheboygan Ave.
Madison, Wisc. 53706

University of Wisconsin
Bureau of Audio-Visual Instruction
1313 W. Johnson St.
Madison, Wisc. 53706

APPENDIX E 2

Suppliers of Resource Materials

Aaron, James E. and Strasser, Marland K. *Driver and Traffic Safety Education: Content, Methods, and Organization*, The MacMillan Company, New York, 1969.

AEtna Life and Casualty Company in consultation with Pepyne, Edward W. *Teacher's Manual: AEtna Drivotrainer System*, film sections, AEtna Life and Casualty Company, Driver Education Services, Hartford, Connecticut, 1971.

Allstate Insurance Company, *Allstate Good Driver Trainer System*, film booklets, Allstate Enterprises, Inc., Northbrook, Illinois, 1971.

American Automobile Association, *Practice Driving Guide for Use With Sportsmanlike Driving*, 6th Edition, Webster Division, McGraw-Hill Book Company, New York, 1970.

American Automobile Association, *Sportsmanlike Driving: Teacher's Guide*, The South Carolina Educational Television Center, AAA, Washington, D.C., 1967.

American Automobile Association, *Teacher's Handbook for Sportsmanlike Driving*, 6th Edition, Webster Division, McGraw-Hill Book Company, New York, 1970.

American Automobile Association, *Teaching Driver and Traffic Safety Education*, Webster Division, McGraw-Hill Book Company, New York, 1965.

Anderson, William G. *In-Car Instruction: Methods and Content—A Manual for Teachers of Driver and Traffic Safety Education*, Addison-Wesley Publishing Company, Reading, Massachusetts, 1968.

Anderson, William G. *Laboratory Manual for Learning to Drive*, Addison-Wesley Publishing Company, Reading, Massachusetts, 1971.

Anderson, William G. *Learning to Drive: Skills, Concepts, and Strategies*, Addison-Wesley Publishing Company, Reading, Massachusetts, 1971.

Anderson, William G. *Teacher's Manual for Learning to Drive*, Addison-Wesley Publishing Company, Reading, Massachusetts, 1971.

Automotive Safety Foundation, *A Resource Curriculum in Driver and Traffic Safety Education*, Automotive Safety Foundation, Washington, D.C., January 1970.

Brody, Leon and Stack, Herbert J. *Highway Safety and Driver Education*, Prentice Hall, Inc., Englewood Cliffs, New Jersey, 1954.

Center for Safety Education, New York University. *Driver Education and Traffic Safety*, Prentice Hall, Inc., Englewood Cliffs, New Jersey, 1967.

Center for Safety Education, New York University. *Man and the Motor Car*, Prentice Hall, Inc., Englewood Cliffs, New Jersey, 1962.

Glenn, Harold T. *Youth at the Wheel*, Chas. A. Bennett Company, Inc., Peoria, Illinois, 1958.

Halsey, Maxwell, Kaywood, Richard, and Meyerhoff, Richard A. *Let's Drive Right* (Fifth Edition), Scott, Foresman and Company, Glenview, Illinois, 1972.

Kearney, Paul W. *How to Drive Better and Avoid Accidents*, Thomas Y. Crowell Co., New York, 1963.

Malfetti, James L. *A Description of the Driving Task Adaptable for a Manual for Beginning Drivers*, Teachers College, Columbia University. Prepared for American Association of Motor Vehicles Administrators by the Institute for Highway Safety, 1970.

McKnight, A. James and Adams, Bert B. *Driver Education Task Analysis Volume I: Task Descriptions*, Human Resources Research Organization (HumRRO) Alexandria, Virginia, November 1970.

McKnight, A. James and Hundt, Alan G. *Driver Education Task Analysis Volume III: Instructional Objectives*, Human Resources Research Organization (HumRRO) Alexandria, Virginia, March 1971.

National Committee on Uniform Traffic Laws and Ordinances. *Uniform Vehicle Code and Model Traffic Ordinance*, The Michie Company, Charlottesville, Virginia, 1968.

National Education Association, *How Experienced Teachers Develop Good Traffic Citizens: Tips and Cues*, Washington, D.C. 1958.

North American Professional Driver Education Association, *The New Driver's Guide*, (Strasser/Aaron), the San Dale Press, Bloomington, Illinois, 1965.

Pawlowski, Joseph G. and Johnson, Duane R. *Tomorrow's Drivers: Teacher's Edition*, Lyons and Carnahan, Chicago, 1971.

Quane, W. Laurance, *Utilizing the Multiple Car Driving Range*, Industrial Technology/Traffic and Safety Education, Illinois State University, Normal, Illinois, June 1971.

Strasser, Marland K., Eales, John R., and Aaron, James E. *Driver Education: Learning to Drive Defensively*, Laidlaw Brothers, River Forest, Illinois, 1969.

U.S. Air Force, *The Safe Driving Handbook*, Grosset and Dunlap, New York, 1970.

U.S. Department of Transportation, Federal Highway Administration, *The New Look in Traffic Signs and Markings*, U.S. Government Printing Office, Superintendent of Documents, Washington, D.C. 1972.

Wiemer, M. Wayne, *The Eye-Check Driver Evaluation and Instruction Method: Teacher's Manual*, 1100 Prairies Lawn Rd., Glenview, Illinois, 1970.

U.S. GOVERNMENT PRINTING OFFICE 1974 O - [illegible]